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LIND, J.

A
T R E A T I S E
O F T H E
S C U R V Y.

I N T H R E E P A R T S.

C O N T A I N I N G

An inquiry into the Nature, Causes,
and Cure, of that Disease.

Together with

A Critical and Chronological View of what
has been published on the subject.

By JAMES LIND, M. D.

Fellow of the Royal College of Physicians in *Edinburgh*.

E D I N B U R G H:

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Who...
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1915

T O

The RIGHT HONOURABLE,

GEORGE Lord ANSON,

⁂c. ⁂c. ⁂c.

Who, as a just reward for the great
and signal services done to the BRITISH
NATION, does now preside
over her NAVAL AFFAIRS,

The following TREATISE
IS INSCRIBED,

With the greatest respect,

By his LORDSHIP'S

Most devoted, and

Most obedient

humble servant,

JAMES LIND.

P R O F E S S O R

The first part of the book is devoted to a general survey of the subject. The author then proceeds to a detailed examination of the various aspects of the problem. In the final chapter, the author discusses the implications of the findings and offers some suggestions for further research.

The book is written in a clear and concise style, and is accessible to a wide range of readers. It is a valuable contribution to the literature on the subject, and is highly recommended for those interested in the field.

P R E F A C E.

THE subject of the following sheets is of great importance to this nation; the most powerful in her fleets, and the most flourishing in her commerce, of any in the world. Armies have been supposed to lose more of their men by sickness, than by the sword. But this observation has been much more verified in our fleets and squadrons; where the scurvy alone, during the last war, proved a more destructive enemy, and cut off more valuable lives, than the united efforts of the French and Spanish arms. It has not only occasionally committed surprising ravages in ships and fleets, but almost always affects the constitution of sailors; and where it does not rise to any visible calamity, yet it often makes a powerful addition to the malignity of other diseases. It is now above 150 years since that great sea-officer, Sir Peter Hawkins, in his observations made in a voyage to the South sea, remarked it to be the pestilence of that element. He was able, in the course of twenty years, in which he had been employed at sea, to give an account of 10,000 mariners

riners destroyed by it. But I flatter myself, that it will appear from the following treatise, that the calamity may be prevented, and the danger of this destructive evil obviated: nor is there any question, but every attempt to put a stop to so consuming a plague, will meet with a favourable reception from the public.

It is a subject in which all practitioners of physic are highly interested. For it will be found, that the mischief is not confined to the sea, but is extended particularly to armies at land; and is an endemic evil in many parts of the world. This disease, for above a century, has been the supposed scourge of Europe. But how much even the learned world stands in need of farther light in so dark a region of physic, may appear from the late mournful story of the German troops in Hungary, the disaster in Thorn, and from many other relations in this treatise.

What gave occasion to my attempting this work, is briefly as follows.

After the publication of the Right Honourable Lord Anson's voyage, by the Reverend Mr Walter, the lively and elegant picture there exhibited
of

of the distress occasioned by this disease, which afflicted the crews of that noble, brave, and experienced Commander, in his passage round the world, excited the curiosity of many to inquire into the nature of a malady accompanied with such extraordinary appearances. It was acknowledged, that the best descriptions of it are met with in the accounts of voyages: but it was regretted, that those were the productions only of seamen; and that no physician conversant with this disease at sea, had undertaken to throw light upon the subject, and clear it from the obscurity under which it has lain in the works of physicians who practised only at land. Some time afterwards, the society of surgeons of the Royal navy published their laudable plan for improving medical knowledge, by the labours of its several members; who have opportunities of inspecting Nature, and examining diseases, under the varied influence of different climates, seasons, and soils. I then wrote a paper on the scurvy, with a design of having it published by them. It appeared to me a subject worthy of the strictest inquiry: and I was led upon this occasion to consult several authors who had treated of the disease; where I perceived mistakes which have been attended, in practice, with dangerous and fatal consequences. There appeared to me an
evident

evident necessity of rectifying those errors, on account of the pernicious effects they have already visibly produced. But as it is no easy matter to root out old prejudices, or to overturn opinions which have acquired an establishment by time, custom, and great authorities; it became therefore requisite for this purpose, to exhibit a full and impartial view of what has hitherto been published on the scurvy; and that in a chronological order, by which the sources of those mistakes may be detected. Indeed, before this subject could be set in a clear and proper light, it was necessary to remove a great deal of rubbish. Thus, what was first intended as a short paper to be published in the memoirs of our medical navy-society, has now swelled to a volume, not altogether suitable to the plan and institution of that laudable and learned body.

I cannot, however, upon this occasion, omit acknowledging with gratitude the many excellent practical observations I have been favoured with by some of its most worthy members; especially by the ingenious Mr Ives of Gosport; and Mr John Murray, an eminent surgeon at Wells, in Norfolk. Notwithstanding which advantages, I am sensible of many inaccuracies and imperfections in
this

this performance. They are perhaps the more numerous, as it has been sent to the press sooner than was at first intended. There are, however, two things that may appear exceptionable, which I ought here particularly to mention.

The first is the plan of the work.

I am sorry to find myself under a necessity of offering what some of my readers may think very indifferent entertainment, and that at their setting out, in the critical chapters of the first part. But it was not easy to fall upon a method equally adapted to all readers: nor indeed is the arrangement of the several chapters a matter of any great importance. The order here followed, is that in which it ought to be perused by physicians and men of learning, who have made this disease their study, and are previously acquainted with former writings upon it. It was necessary, in order to prevail with some of these gentlemen to peruse the second part with less prejudice against me, to endeavour first to remove such objections as might arise from doctrines imbibed in younger years, in schools and universities. Others, who are not so well acquainted with the subject, I would advise to begin with the second part; which

b

will

will enable them to form a better judgment of the first. The *Bibliotheca scorbutica*, or the collection of authors on the scurvy, is placed at the latter end of the book, as proper to be consulted in the dictionary-way. And it is to be remarked, that when, to avoid repetitions in the first and second parts, an author's name is barely mentioned, recourse must be had to the Alphabetical Index; which points out the page where the title of the book referred to, or its abridgment in part 3. is to be found.

In the order of the chapters, the prevention of the disease precedes its cure: and the first being the most material, I have thrown great part of the latter into it; this method of treating the scurvy suiting it better than perhaps any other. It will appear, that in the plan I have pursued, I had in view an author whose book has met with a general good reception, Astruc de morbis veneris; and were other diseases treated in like manner, it would greatly abridge the enormous, and still increasing number of books in our science.

What may be deemed by critics equally exceptionable with the order of the chapters, are some few repetitions. But in certain cases they were necessary,

necessary, in order to obviate prejudices at the time they might naturally arise, and to enforce the argument.

As to the contents of the book in general :

In the first part, I have endeavoured, by a connected course of reasoning in the several chapters, to establish what is there advanced, upon the clearest evidence, confirmed by some of the best authorities ; and have laid aside all systems and theories of this malady which were found to be disavowed by nature and facts. Where I have been necessarily led, in this disagreeable part of the work, to criticise the sentiments of eminent and learned authors, I have not done it with a malignant view of depreciating their labours, or their names ; but from a regard to truth, and to the good of mankind. I hope such motives will, to the candid, and to the most judicious, be a sufficient apology for the liberties I have assumed.

Dies diem docet.

The principal chapters of the second part, containing a description of this disease, its causes, the means of preventing and curing it, are also

founded upon attested facts and observations, without suffering the illusions of theory to influence and pervert the judgment. For, that things certain may precede what is uncertain, the theory, and the inferences from it, are placed at the latter end.

In the third part, where I have given an abridgment of what has been written upon the subject by the most celebrated medical authors, and others, I have always endeavoured to express their sentiments with as much clearness and conciseness as I could. I have indeed through the whole aimed at perspicuity rather than elegance of diction, as most proper in a book of science. To know a disease, and to cure it, being the two things most essential to be learned; I have therefore transcribed the symptoms and cure of the scurvy from those authors, where they do not entirely copy from each other.

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E R -

E R R A T A.

Mr *Cook*, author of the letter, p. 335. has informed me, since it was printed off, that he is not a physician, but a surgeon in *Hamilton*.

I have reason now to believe, that the book quoted p. 264. was not written by *Olaus Petræus*, the person I there meant, who was a *Dane*, and practised at *Bergen*; but by *Henricus Petræus*, Professor at *Marpurg*.

Dr *Mead*'s discourse on the scurvy should have been quoted for the dissections, N° 1. p. 311.

A
T R E A T I S E
O F T H E
S C U R V Y.

P A R T I.

C H A P. I.

A critical history of the different accounts of this disease.

IN the first accounts given us of this disease, by *Ronssæus*, *Echthius*, and *Wierus* (*a*), it is surprising to find, not only an accurate description of it, but an enumeration of almost all the truly antiscorbutic medicines that are known to the world even at this day.

(*a*) The first authors on the scurvy. *Ronssæus* and *Echthius*, though cotemporary, wrote separately, without having the benefit of seeing each others works.

A

Ronssæus,

Roussseus, who believed it to be the same disease that is described by *Pliny* (*b*), and is said to have afflicted the *Roman* army under the command of *Cæsar Germanicus*, observed, that in his time it was to be met with only in *Holland*, *Friesland*, and *Denmark*; though he had heard of its appearing in *Flanders*, *Brabant*, and some parts of *Germany*. From seeing some of those countries entirely free from this distemper, he was induced to ascribe its frequency in other places to their soil, climate, and diet. In order to prove which, he wrote his first epistle (*c*).

Echthius seems to be the first who gave rise to the opinion of its being a contagious or infectious *lues*. He was led into that mistake, by observing whole monasteries who lived on the same diet, and in the same air, at once affected with it, especially after fevers; which no doubt might become infectious in close and confined apartments. He imagined, therefore, that a scurvy might in a manner be the *crisis* of a fever, which as such he deemed contagious.

(*b*) Vid. part 3. chap. 1.

(*c*) Intituled, *Quare apud Amsterodamum, Alecmariam, atque alia vicina loca, frequentissime infestet scorbutus?*

But

But where *Wierus* transcribes the symptoms from this last author, (which he does almost *verbatim*), upon this occasion he very justly differs from him. He observes, that the scurvy is not properly the *crisis* of a fever; but, like many other diseases, may be occasioned after it by unsound viscera, and a vitiated state of blood. He imagines people were induced to believe it a contagious malady, by seeing many whole families alike affected; but this he ascribed to the *sameness* of their diet. He was however deceived (probably by the authority of *Echthius*) in thinking, that where the gums were putrid, the disease might be infectious: and accordingly makes it a doubt, whether in some parts of the *Lower Germany*, where it had lately appeared, it was owing to their diet, or to infection. But it shall be fully proved hereafter, that the scurvy is not contagious or infectious (*d*).

It may be proper to observe further, that *Wierus* had described the various and extraordinary symptoms of this malady, in so accurate a manner, that the succeeding authors for a long time did nothing more than copy him. It was a considerable time afterwards, when

(*d*) Chap. 4.

A 2

Solomon

The numbers correspond with those in the complete chronological list of publications.

Solomon Albertus wrote a large treatise on this subject, wherein he assumes great merit to himself in discovering a symptom not taken notice of by any author, and which he had once or twice observed in this disease, viz. a *rigor* or stiffness of the lower jaw. However, *Wierus* still continued in the greatest esteem and reputation; and his book was deemed the standard on this subject, even till the time of *Eugalenus*, who gives it that just character, and refers to it almost entirely for the cure. He must be allowed therefore to have been a good judge of this distemper: and as he was a person of eminent learning, as well as probity, (which his writings on this and many other subjects sufficiently shew), his word may be relied upon, when he tells us, that in his time this disease was peculiar to the inhabitants of the countries upon the north seas: he had never met with it in *Spain*, *France*, nor in *Italy*; nor was it to be seen in the large tract of *Upper Germany*: and as to *Asia* and *Africa*, if ever it appeared there, it would no doubt be in such places as lay adjacent to the sea; where such a situation, and a gross diet, with the use of putrid water, might give rise to it, in the same manner as they do in the countries where
it

it was endemic. These were not conjectures in our author; for he was a great traveller, and had visited all the places he talks of (*e*). A book wrote in those times by him, *De præstigiis demonum*, adds much to his reputation; as it shews he was neither so weak, nor credulous, as some later writers on the scurvy.

Brunnerus, who may be deemed the next judicious author after him on this subject, observed, that in his time, when the use of wine was become more common, the scurvy was not so frequent as formerly, even in those countries where it had been endemic.

Notwithstanding which, in a very short time after, we are surpris'd with accounts of this supposed contagious *lues* having spread far and wide. In less than thirty years after *Wierus*, *Solomon Albertus*, in his dedication to the Duke of *Brunswick*, after some very pathetic declamations on the vices of the times, observes, that he had met with the scurvy every where; and that it prevailed in *Misnia*, *Lusatia*, on the borders of *Bohemia* and *Silesia*, &c.

However, the disease as yet still retained the same face; the symptoms and appearances in it the same. For though this author (who

(*e*) *Vid. Melchior Adam in vita Wieri.*

practis'd

practised in a place where *Wierus* says the scurvy was uncommon) had discovered one extraordinary symptom, before mentioned, sometimes accompanying it; and which certainly was but rarely to be seen, as it escaped the observation of every one but himself: yet in other respects, he, as well as his contemporary writers, gives us the same account of it as *Wierus* had done before; and particularly, that the putrid gums and swelled legs were the most certain and only characteristic signs of it (*f*).

But in eleven years after him, we are likewise acquainted by *Eugalenus*, with the surprising rapidity with which this contagious *lues* had made its progress over almost the whole world. And what is still more remarkable, the face of the disease was in a few years so much changed, that the putrid gums and swelled legs were no longer characteristic signs of it, as it often killed the patient before these symptoms appeared (*g*). And it is highly probable from

(*f*) *Signa mali hujus characteristicæ non alia sunt, præter duo illa (quorum supra meminimus) gemina, symptomata pathognomica appellata, indubia morbi indicia, viz. stomacace et sceletyrbe. Cætera symptomata ancipitia sunt et vaga.* Alberti historia scorbuti, p. 546.

(*g*) P. 10. and 211. The *Amsterdam* edition of *Eugalenus*, published in the year 1720, is here quoted.

the histories of above 200 cases of patients delivered in his book, wherein mention is made of the gums being affected in one person only, that such symptoms did now but rarely, if at all, occur.

This malady was also greatly increased in virulence, as he gives us to understand in different parts of his performance: all which he would persuade us to have proceeded from a very singular cause (*b*).

Its effects and symptoms were now various and innumerable (*i*): and it was also become a much more frequent calamity than it appears to have ever been formerly; at least, if we may take this author's word for it, who upon

(*b*) P. 250. where talking of the pox and scurvy as both modern diseases, *Utrique etiam peculiare hoc nostro seculo fuit, ut quàm longissimè latissimèque sua pœria dilatent et diffundant, atque procul à generationis suæ locis et terminis, ad incognita et remota loca excurrant evagenturque, atque sub diametrali linea, quâ sibi invicem, sub polorum oppositione, opposita sunt, se mutuò quasi complectantur, et inter se virus ac venenum suum communicent. Ita fit ut hodie etiam Germaniæ, Angliæ, Galliæ, hic morbus innotescat; apud quos antea ne quidem auditum ejus nomen fuit.* He says the same thing in the dedication of his book to the Count of Nassau. Some of his editors have taken care to have this dedication suppressed in the later editions. It is indeed a most curious piece.

(*i*) *Tam varii sunt effectus quos hic morbus edit, ut minimas omnium differentias numero comprehendere non magis ferè possibile sit, quàm arenam maris numerare, p. 217.*

this

this occasion expresses himself in very hyperbolic terms. And we must indeed allow him to have had a very extensive practice, since he informs us that he had seen almost innumerable patients afflicted with only one particular symptom of the malady (*k*).

But besides the natural reasons which he assigns, he is likewise pleased to introduce some moral considerations, to account for the great frequency and virulence of this distemper, and the extraordinary symptoms which he ascribes to it. In one place (*l*) he attributes its irregular appearances to the operation of the devil. But in another, he thinks this new and surprising calamity sent, by divine permission, as a chastisement for the sins of the world. And as he really thought himself (as appears through the whole treatise) the most sagacious detector of this *Proteus*-like mischief, lurking under various and surprising appearances, he

(*k*) Thus in a scorbutic quotidian, *Plures mendaci quotidianæ febris typo ab hoc morbo ægrotarunt, quàm ut numero hîc comprehendî queant*, p. 231. Talking of scorbutic pains in various parts of the body, *Describendis nominibus eorum qui ab his doloribus variè exercitati elapsis hisce annis fuere, vix sufficeret præsens charta*, p. 51. Those patients, he again repeats, were almost innumerable, p. 258.

(*l*) P. 81.

very religiously thanks Heaven for the important discovery (*m*).

Now, as this book has been often reprinted in different parts of *Europe*, has been recommended by the greatest authority, by *Boerhaave* to his pupils, by *Hoffman*, &c. and is looked upon at this day as the standard author on our subject (*n*); it may be worth while to inquire into the contents of it, as well as the merit of its author. And we shall begin with observing wherein he differs in his account and description of this disease, from all preceeding authors. For as to those who succeeded, they did little more than copy him. So that I shall have few remarks to make upon these, till we come to *Dr Willis*, who gives us a somewhat different account of its symptoms.

(*m*) *Quod idèò permitttere Deus videtur, ut hoc modo iram suam adversus peccata ostendat, dum novis et inusitatis morbis et ægri- tudinibus, nunquam priùs cognitis ac visis, mortale genus in ira sua visitat et castigat; ut etiam vulgus nostras, morborum novitate admonitum, intelligat differentes hujus temporis febres ac morbos esse, ab iis qui ante aliquot annos homines affixerunt. Agamus igitur Deo gratias, quòd pro sua infinita misericordia ac clementia tam benignè eos nobis revelare dignatus sit, p. 222.*

(*n*) It is said very lately by *Haller*, to be universally esteem- ed the best book written on the scurvy. *Vid. Boerhaave metho- dus studii medici.*

Eugalenus differs from all preceding authors.

1st, In supposing the malady may be far advanced, before (what they judged) the most equivocal and uncertain signs appeared in it. “ Thus, (says he), after a long continuance
“ of the distemper, the patient has a constant
“ languor, a numbness, a sense of heavy pain
“ in his legs, or an acute pain in any part (o).” But such symptoms are by *Echthius* classed in a separate chapter, under the denomination of *the remote signs common to this disease with others*. And *Forrestus*, who had the greatest opportunity of being conversant with scorbutic cases, by living in a sea-port town, mentions them as the symptoms only of the approaching evil. He says, that upon their appearance he hesitated for some time, till the proper and peculiar symptoms of this disease appeared, *viz.* the putrid gums, &c. which put the matter out of all doubt. But *Eugalenus* supposes the scurvy often to destroy the patient before the appearance of these latter (p).

2^{dly}, On the contrary, he supposes, that those symptoms which, according to all others, ap-

(o) P. 14.

(p) P. 10. et 211.

pear only in the last and most advanced stage of this malady, often occur in the very beginning, and without any other previous scorbutic sign; such as, frequent fainting-fits, atrophies, dropfies, &c.; which last are mentioned by *Brucæus* and others, as the consequences of the most inveterate and confirmed scurvy.

So that whereas formerly the malady had a regular progression of symptoms in its different stages, accurately related by *Wierus* and many others, it became in *Eugalenus's* time the most irregular and deceitful evil that we can well imagine.

3dly, *Eugalenus* differs from all preceeding authors in his description of many symptoms peculiar to this disease. Thus, scorbutic ulcers, according to him, are dry (*q*): whereas these ulcers are described formerly in this disease, as having quite a contrary appearance, viz. fungous, foetid, &c. Also the *dyspnœa* in scorbutic persons, formerly most troublesome upon using exercise or motion, is described by *Eugalenus* with very different marks; as is the *diarrhœa*, and almost all the other symptoms.

(*q*) Sect. 49. In the first pages of his book, which are copied from *Wierus*, he describes the ulcers more truly.

4^{thly}, He has ascribed to this disease many new symptoms, seemingly opposite to the genius of it; at least never taken notice of by any before him: though *Dodonæus*, *Wierus*, and many other writers, may be supposed to have had an opportunity of seeing it in its utmost virulence, when epidemic in the year 1556, in the places where they then lived; and where in all probability it has never since raged in such a degree. The symptoms he mentions, are cancers, buboes, ulcers of the *penis*, loss of memory, symptoms of the plague, &c.

Now, these different accounts and descriptions of the same disease, can be accounted for but in two ways.

This distemper must, in a very short time after the first accounts of it were published, have made an incredible progress, become an universal calamity, and assumed quite a new appearance and different symptoms. This was the opinion of *Eugalenus*; who, although he has given such a new and different relation of it, yet tells us expressly, it was the *stomacacia* of *Pliny*, the disease described by all other authors under the name of *scurvy*; with whom he agrees in assigning the same causes and cure. For which last, in particular, he refers us to these authors.

Or we may suppose, that this author might be mistaken, in thinking the disease he has described, to be precisely the same that was formerly known by that appellation: yet perhaps there may be found some analogy or resemblance betwixt what he deemed such, and the former accounts we had of the scurvy; so that they may be said to border on each other. Or at least he has given this denomination to a complication of various symptoms first described by himself; and thus has characterised under the name of *scurvy*, a particular disease, or class of diseases; in which he has been followed by succeeding authors.

Upon the first supposition, before we can give entire credit to him, and believe so great an alteration to have happened in this distemper, it is necessary we should know what grounds he had for his opinion, and what reasons induced him to believe, that so many diseases, various and opposite in their appearances, were nothing more than the scurvy lurking under these different forms. It is at least required, that there should have been in the effects or appearances of the diseases, some distant analogy or resemblance left; otherwise there will
be

be a strong presumption that here he might be mistaken.

But instead of pointing out to us any such similarity or resemblance betwixt the diseases he has described, and the real scurvy as described by all others before him; he has fallen upon a most extraordinary method of proving their identity, by *assuming for pathognomic and demonstrative scorbutic signs, such symptoms as had never been observed in the disease before; viz. such a state of urine and pulse as is entirely different from the description given of them by the most accurate writers (r).*

Now,

(r) Vid. part 3. chap. 2. *Forrestus* tells us, that in this malady the state of the urine deserves no regard; and wrote three books to prove it fallacious. Although *Reusnerus* does not in this agree with *Forrestus*; yet he, as well as *Wierus*, differs widely from *Eugalenus* in the description of the urines in this disease. As to the state of pulse described by *Eugalenus*, which he asserts to be the most constant concomitant of this distemper, p. 30. it is remarkable, he is the first author who mentions such a condition of pulse to have ever been observed in the scurvy. *Reusnerus* says, the pulse is here inordinate; in which he likewise differs from all other authors: but it is plain by his book, this was a supposition made from theory, and not from observation. (Vid. *Reusner*. p. 382.). He makes it at the same time flow.

Notwithstanding all which, the pulse and urine, or either of them, convince *Eugalenus* of the existence of the scurvy, though in other respects the symptoms should differ from it as much as the

the

Now, upon a supposition that the pulse and urine, like the rest of the symptoms, had also varied in this distemper from their former appearances, it was then incumbent upon him to prove the identity of these diseases by other marks, and not by those symptoms wherein the disease differed from itself.

Besides the pulse and urine, which were to him the most demonstrative signs, he often mentions some other marks or diagnostics; upon which, however, he does not depend so much as on the former; though he often in-

the plague does from a dropfy. *Sufficiant ad denotandam malignam causam quæ ab urina et pulsu indicia sumuntur, p. 120. De his omnibus, certum à pulsu & urina, vel ab horum alterutro, indicium est, minimèque fallax, p. 89. Citra alia indicia, non semel ad morbi cognitionem nos sola urina deduxit, p. 23.*

Our author could not perhaps well have fallen upon two more uncertain diagnostics than those of the pulse and urine, by which alone he characterises so many various diseases, acute and chronic. The mighty faith he had in urine, the most fallacious of all medical signs, one would have thought sufficient to have destroyed his credit with the judicious. As to the pulse, it varies so much in old and young, and in the different sexes; the constitution of the body, the situation, and other circumstances of the artery, all what physicians call *the nonnaturals*, have so remarkable an influence upon it, as to make the diagnostics taken from it singly, to be very fallacious in any disease.

There is indeed the utmost absurdity in his accounts of both; and, what is very remarkable, most of the cases at the latter end of his book, are manifest contradictions to the diagnostics delivered in the first part of it.

roduces

roduces them to confirm the judgment he had formed of such diseases. And it may be proper, in justice to him, to take notice of them all; which I think may be properly referred to these two classes.

1st, Such symptoms as the before mentioned conditions of pulse and urine, that never were remarked in the scurvy by any but himself; and seem indeed more peculiar to other distempers; *viz.* recurring anxieties at the region of the stomach, under the diaphragm (*f*); — a ball in the throat (*t*); — a tumor moving from one part of the body to another (*u*); — retchings to vomit in the beginning of a fever (*x*).

2^{dly}, Such as are common to this disease with many others; and which the authors who preceded him, call the remote and doubtful symptoms; *viz.* an obtuse or dull pain of the legs, which he often mentions as a convincing proof of the scurvy (*y*); — dejection of mind (*z*);

(*f*) P. 142. and in many other places.

(*t*) P. 154.

(*u*) Diag. 23. p. 212.

(*x*) P. 235.

(*y*) P. 145. 201. 206. 216. 235. and particularly p. 50.

(*z*) Obs. 15.

— being

— being worse after purgatives (*a*); — a languor, rather than sickness; — a slow disease without any evident cause; — sometimes a vomiting, faintings, and a change of colour in the face; — an eruption on the face and breast in a fever (*b*); — nay, an eruption on the body after death, and not till then, he makes a demonstrative sign of the scurvy (*c*), or just at the approach of it (*d*).

But these diagnostics he seems to rely upon no further, than to corroborate the proofs he had from the pulse and urine.

Now, as these are the principal marks and diagnostics of the diseases described by *Eugalenus*; among which there are not to be found any of those symptoms which the authors preceding him thought absolutely necessary to demonstrate the existence of the disease which they had described under the name of *scurvy*; and as *Eugalenus* assumed for demonstrative and constant signs of this disease, such as were never before observed in the true scurvy, nor are ever seen to occur in it at this day, as afterwards will be more fully proved: we must necessarily conclude, that he has described a

(*a*) P. 152.

(*b*) Diag. 25. p. 236.

(*c*) P. 124.

(*d*) P. 187. et 189.

C

different

different disease; which appears from his whole treatise, and will be further confirmed by what follows.

It is indeed surprising, in so extensive a practice as he pretends to have had, that in his book, containing 72 observations, and above 200 cases of different patients, given us by him or his editor, there is not mention made of one truly scorbutical case wherein the gums were affected, except in a very extraordinary and dubious relation of a clergyman (*e*); who contracted his indisposition by a costiveness, being accustomed when in health to have ten or twelve natural stools a-day; whom he cured by bleeding, and some antiscorbutics which he does not mention; and by restoring his belly to its usual lax state.

It is true, he maintains, that the scurvy often kills before it affects the gums or the legs (*f*). But is it credible, among such a number of patients as he treated in this disease, which in many places he tells us were almost innumerable, that in the before mentioned case alone the putrid gums were observed; which formerly, during the most virulent rage of this evil, and at this day, as shall be afterwards proved,

(*e*) Obs. 72.

(*f*) P. 10.

is the most constant, chief, and characteristic symptom of it?

For a specimen of the questions he asked his patients, see *p.* 32. & 98. where he recapitulates all his diagnostics of scorbutic diseases; and it does not appear he ever looked for such signs.

He gives but one instance of the teeth being loose (*g*); where he observes there were much more demonstrative signs of the scurvy, *viz.* the pulse, urine, oppression on the *præcordia*, and faintings; adding it in the last place, as a symptom of the least moment (*h*).

He takes notice of spots as a sign of this disease, only in the scorbutic atrophy; though he produces but one very doubtful scorbutic atrophical case (*i*) wherein they appeared.

We shall compare him in this respect once more with the authors who preceeded him. *Reusnerus* wrote but four years before him; and has collected into a volume of considerable bulk, almost all that had been written upon

(*g*) *Obs.* 47.

(*h*) *Ultimo, et dentium laxatio. Sed quia hæc primum sub morbi finem incidit, minus ad monstrandum morbum hunc ponderis habuit; quòd prius ægrota ab hoc morbo interfici potuit, quàm ab hoc signo morbus cognosci.*

(*i*) *Obs.* 34.

the scurvy. After describing the putrid gums and spots, he expresses himself thus. “ These
 “ are the pathognomic signs of the scurvy,
 “ without whose appearance the disease can-
 “ not subsist (*k*).”

IT may be said, that though the diseases were not precisely the same, yet *Eugalenus* under the same name has characterised a certain disease, or species of diseases, in which he has been followed by all other authors; and his successful cures, to which he so often appeals, seem to confirm it. This leads me to the only diagnostic which I have omitted to mention; being reserved for this place, as the most distinguishing characteristic of all the diseases described in his book, and which is to be met with almost in every page (*l*). It is there called *Regula diagnostica generalissima* (*m*), viz. its being

(*k*) *Et hæc signa sunt scorbuti pathognomica, quæ sine rei in qua sita sunt interitu abesse nequeunt. Reusneri exercitat. de scorbuto, p. 328.*

(*l*) P. 27. 127. &c.

(*m*) *Viz. Nam si quis nobis in his regionibus morbus occurrat rarus, vel etiam aliquis veteribus cognitus, sub aliis, et diversis, atque plurimum ab eorum descriptione discedentibus signis, statim mendacem ejus speciem suspectam habere oportet, et huc atque ad hunc morbum cogitationes dirigere, diligenterque cum morbi mores, et causas ejus antecedentes,*

being a disease not properly described by the ancients : to which he often adds, its not submitting to the cure prescribed for it by these old authors.

He recommends the perusal of his book to such only as are conversant in the writings of the ancient *Greek* and *Roman* physicians (n); otherwise he observes they will never be able to distinguish old diseases from the new. The last of which, or what he imagined to be such, he has promiscuously classed, without any other distinction, under the general name of *Scurvy*.

To give the reader the true idea the author had of the scurvy, by which he may be enabled to judge what particular disease, or species of diseases, he has characterised; it is precisely this.

He seems to have been of opinion, with an eminent physician of that age, who takes occasion from *Solomon's* saying, there was nothing new under the sun, to assert, that all distempers were

tum pulsum et urinam explorare, taliane sint quæ huic morbo convenient, eumque quadam suâ proprietate exprimant et demonstrent. Soon after adding, *Non video quis præterea dubitationi locus esse possit, nisi perpetuò cogitationibus nostris oberrare et incertum vagari velimus,* p. 179.

(n) P. 227.

the

the same formerly as at present. To this our author, however, makes two exceptions, in the pox and scurvy, (*p.* 250.); where he imagines that the one travels from the north, the other from the south; and that, upon their meeting, they communicate and intermingle their poison with each other. But he was entirely unacquainted with hysteric and hypochondriac ailments, and a train of others now going under the name of *nervous*. He knew very little of the rheumatism, rickets, and many others; which, if at all, have been very imperfectly described by the ancients. Hence, whenever such cases occurred, with this peculiarity, of not being described in ancient authors, he directly pronounced them scorbutic.

Thus, he imagined, that the scurvy might assume the form of almost all diseases, acute or chronic, incident to the human body: or, in other words, that the numerous and various distempers described in his book, from the plague to a simple intermitting fever, might be produced by this one scorbutic cause; and that each of these manifold diseases might subsist singly and separately, without the appearance of any symptom formerly observed in the scurvy described by others; or even any one
symptom

symptom common to those described by himself, except the appearances in the urine and state of the pulse. The first of which, he tells us himself, is often fallacious; and though he mentions the pulse as the only symptom (o) in which all such diseases agree, yet, from many other parts of his book, it appears, that the pulse also was, and certainly must be very various in so many different cases (p).

But as difference of climates must needs have a great influence, even on the same disease; accordingly we find the crises and types of fevers and other distempers, to vary in these cold climates, from the description given of

(o) P. 30.

(p) If the criticism on *Eugalenus* appears too tedious, it must be considered, that it is the basis of all the reasoning in this first part of the work. Nor must the reader imagine, that although he be found to have published very great absurdities, yet he is but one author only, and seems not to deserve so serious a confutation. Such as are ignorant of the history of the disease, and have not taken the pains to look into the *Bibliotheca*, part 3. must be informed, that his whole book almost is transcribed by *Sennertus* and *Martini*; and its greatest absurdities by *Horstius*, *Lister*, and many others. Had these authors confirmed what he advances, by facts and observations, *Eugalenus* had justly merited the compliment they pay him. But, on the contrary, they assert most things in their writings entirely upon the faith of *Eugalenus*; so that, according to his fate, the credit of many authors must stand or fall.

them

them in more southern countries, where the ancients practised. These and other incidental circumstances, must needs vary the just indications of regimen and cure. This our author makes no allowance for: but when the most common and usual malady deviated in the least from the graphical account given of it by those accurate authors, especially when it did not yield to the method of cure directed by them; all such irregular and untoward symptoms he likewise referred to the scorbutic taint.

Now, whether the disease was altogether and purely scorbutic, or the scurvy was joined or complicated with another malady, no cure could possibly be made in either case, without the common and specific antiscorbutic medicines; which, upon the last supposition, were to be compounded with others proper for these diseases, and which, according to his own account, proved always successful (*q*).

But here we have reason to suspect somewhat worse than ignorance, by which it would

(*q*) *In his omnibus, cum, propter multiplicem symptomatum varietatem raritatemque, causam subesse raram, et veteribus incognitam, considerarem; post varias habitas mecum deliberationes, et diligentem pulsuum urinarumque examinationem, tandem scorbuto adscribendam inveni, conjecturam meam ac σοχασμὸν de his, comprobante felici curationis eventu, p. 30.*

seem he has chiefly imposed upon the world. He informs us, that if the disease was but known, it was very easily cured (*r*); and refers us to *Wierus*, who had wrote most learnedly on this subject before him; the intention of his book being only to detect this *Proteus*-like malady, lurking under so many various and fallacious appearances (*s*). He has indeed furnished us with no other antiscorbutic remedies, than what were recommended before him; as may be seen by his *Therapeutic canons* (*t*). His principal antiscorbutic medicine was scurvy-grass, and next to it, water-creffes and brook-lime. He however fancied some of these to have a more singular and peculiar virtue in particular symptoms of this disease, than others of them. For a *coma* (or *carus* as he terms it) in the scorbutic fever, he particularly recommends *nasturtium aquat.* (*u*), and gives what may be called a miraculous instance of its good effects (*x*): whereas in convulsions attending scorbutic fevers, he prefers

(*r*) P. 140.

(*s*) Ibid.

(*t*) P. 26. 42. 43.

(*u*) P. 44. Canon. ther. 11. Item, p. 124. 125.

(*x*) Obs. 54.

suc. cochlear. (y), and gives an equally surprising history of its good effects (z).

But what idea can any person entertain of this author's veracity, when he relates such numerous and extraordinary cures, in the most tedious and obstinate diseases, performed by such simple medicines; and in so short a time as exceeds all manner of belief? Such was then the efficacy of those herbs, that they rescued many long-unhappy patients from the jaws of death. They removed diseases which had resisted all other methods of cure, and had baffled the skill of the best physicians. With such assertions this book every where abounds. "Many who had laboured under this calamity, confined to bed for weeks, months, nay, years, (as, at the time he was writing, was the case of a widow, owing to the ignorance of her physician), were in a few days, by these powerful antiscorbutic juices, cured of the most obstinate and inveterate ailments (a)."

In a seemingly very bad case of a childbed-woman (b), the scorbutic *deliquium* and *anxiety* were put off for several hours when ap-

(y) Canon. ther. 13. p. 44.

(z) Obs. 53.

(a) P. 129. 147.

(b) Obs. 69.

proaching,

proaching, by these antiscorbutic medicines; which upon this account were repeated eight or nine times a-day. Any one who peruses this relation, will find as extraordinary cases, *viz.* ulcers gaping and shutting, &c. as are to be met with in the records, or perhaps the legends of physic (*c*).

He performed several cures, even in apparently dangerous cases in fevers, by an infusion of a little scurvy-grass in goat-whey (*d*). He removed a malignant fever, chiefly by the addition of *suc. cochlear. dr. ii. ss.* to an aperient potion; which, upon taking four or five times, abated the fever with all its untoward symptoms; but upon discontinuing the medicine for two days, it returned (*e*).

The vanity and presumption of this author are indeed intolerable, when he assures us, that he would cure beginning consumptions in fourteen days (*f*); palsies in five days (*g*), in four days often, but in fourteen at most (*h*);

(*c*) P. 264. 265. Vid. Obf. 33. et 50.

(*d*) Obf. 32.

(*e*) Obf. 59.

(*f*) P. 192.

(*g*) Obf. 16. et 23.

(*h*) P. 63.

violent toothachs in a few hours (*i*); several quartan agues in ten days, otherwise not curable in a year (*k*). In short, according to him, no disease is any longer incurable; and by his means the art of physic is restored to credit and reputation (*l*).

Sometimes indeed the patient expired before the antiscorbutic medicines could be got ready; as was the case of a young girl to whom this fatal accident happened. Here he offered to prove the wonderful effects of his remedies, to the conviction of the whole family, in the eldest son, who laboured also under this affliction. But after a fruitless trial of eighteen days he was dismissed; the father being informed,

(*i*) P. 52.

(*k*) P. 40.

(*l*) *Futurum enim est, ut in morbi notitiam deductus, paucis diebus gravissimas quasque febres sit curaturus, quibus nulla prius veterum profuit curatio. Soon after adding, Quæ, quia à nemine hæctenus satis animadverta sunt, quod sciam, hinc factum esse arbitror, quòd tantopere vilescere apud nos et in his regionibus medicina cæperit, utpote quæ nullius febris curationem certò promitteret.* p. 36.

And repeating the same remark in another place, *Hoc sine arrogantia dicere possum, me certam harum febrium curationem promittere omnibus audere, qui nostris præceptis ac monitis obtemperare, et in assumendis hisce medicamentis consilium nostrum sequi non detreant: siquidem (absit arrogantia dicto) non minùs certò harum febrium curatio mihi nota est, atque digitorum numerus.* Obs. 56,

that

that such medicines were hurtful and improper for so tender an age (*m*).

His extreme ignorance in physic, appears, among many other instances, from his taking a proneness to faint in childbed-women for a demonstrative sign of the scurvy (*n*). In a man of seventy years, he judged a mortification of the foot to be scorbutic, by the black and purple spots which appeared upon the mortified part; and the small, weak, and unequal pulse, naturally to be expected in such a situation (*o*).

He seems to have known no other distinction betwixt the *lues venerea* and scurvy, but the pulse (*p*), and sometimes the urine (*q*).

ALL the succeeding authors, for a considerable time after *Eugalenus*, follow him most religiously and minutely in their description of this disease. So great a compliment is paid him by *Martini*, *Horstius*, and *Sennertus*, that they copy out of him with a scrupulous exact-

(*m*) Obs. 59.

(*n*) P. 194. 197. Item, Obs. 11.

(*o*) P. 108.

(*p*) P. 51.

(*q*) P. 263. Vid. p. 60. 126. 137.

ness, not only the many symptoms he describes peculiar to the malady; (and especially his great dependence on the pulse and urine, for ascertaining its existence); but where he or his editors, in their extraordinary relations of scorbutic cases, mention some very uncommon and singular appearances, these are likewise added by them to the diagnostics of the scurvy.

What additional observations they themselves made, may be seen in the proper place (*r*). They even exceed him in absurdities. Their merit seems chiefly to have consisted in furnishing us with cures, or at least with many medicines for the different diseases described by *Eugalenus*. However, as an apology for *Sennerthus*, he informs us, that he transcribed chiefly from this last author, because the scurvy was not a disease so frequent or common in his own country (*s*).

Eugalenus

(*r*) Part 3.

(*s*) *Traſtātus de ſcorbuto*, p. 140.

To give the reader some idea of the consequence of such writings, and the high esteem these authors gained by their works; we find *Moellenbroek*, who pretended likewise to write upon this disease, or at least a species of it, setting out in his introduction thus. *Immo nullus ferè jam morbus est, cui se non adjungat scorbutus; unde nisi antiscorbutica interdum reliquis admisceat medicamenta, vix eos curabit medicus. Quod in praxi mea expertus sum non rarè. Et novi aliquos, qui scorbutum ejusque antidota negligentes,*

Eugalenus had not talents sufficient to form any sort of theory for illustrating the nature of the many diseases referred by him to the scorbutic taint. The principles he assumes upon particular occasions, of obstructions in the liver and spleen, overflowing of the *atra bilis*, and corruption of the humours, are all borrowed from other authors, lamely explained by him, and often contradicted in his book. *Sennertus's* hypothesis confutes itself. So it

negligentes, in morborum curatione, suum non potuerunt obtinere scopum: ac propterea meo exemplo edocti, maximo cum ægrorum suorum emolumento, eadem postea exhibuere. Quamvis autem valdè frequens sit scorbutus, symptomatibus tamen variis oculatissimos sæpe medicos illudit et decipit; immo ex mille medicis (ut scribit Frentag. cent. 1. observ. 99.) ne ternos quidem invenias scorbuti sat gnaros, ut ut se fingant Æsculapios. Hinc tantæ ægrotorum strages, tanta mortalitas, tanta archiattrorum, necdum gregariorum errata; ut statuas mereantur Fracostorianâ splendidiores, ære perenniores, viri clarissimi Sennertus et Martinus, (adderem ego Gregorium Horstium), qui, penicillo plus quam Apelleo, medicorum opprobrium nobis depinxerunt. Meruisset pyramidem Eugalenus, ni curationem subticuisset.

This last is certainly a false imputation on *Eugalenus*. He seems to have concealed no part of the cure that he knew. Besides referring to *Wierus*, he gives twenty-one general therapeutic canons, and twenty-nine special ones; under most of which he mentions antiscorbutic herbs, adapted to the several intentions of cure. If it was found, that in parallel cases these herbs did not succeed, it does not follow he concealed the cure; the contrary of which appears through his whole book.

Four years after *Moellenbroeck* wrote, and had published the fame of the preceding authors, the world was obliged with *Dr Willis's* treatise.

was left to Dr *Willis*, with the assistance of Dr *Lower*, to clear up a subject that lay under very great obscurity, by reducing the whole into an ingenious system, which continues established and adopted even at this day.

It may be worth while to take notice, that until *Eugalenus's* time, as before mentioned, putrid gums and swelled legs were the pathognomic signs of the scurvy. This last author made them to be a small, quick, and unequal pulse, together with a peculiar state of urine (*t*). But such a condition of pulse is not mentioned by *Willis* to have been observed in any of the cases he gives to illustrate his account of this disease; nor is it so much as mentioned in his book, except under the title of the *Pulsus inordinatus* (*u*); where it is put down with fifty other symptoms; and has no preference given it as a characteristic of the scurvy, more than palsies, convulsions, and the rest of the symptoms which he there enumerates, from the crown of the head to the sole of the foot. It is explained by him afterwards (*x*), when he tells us, that this inordinate pulse, being une-

(*t*) Vid. part 3.

(*u*) P. 228. Amsterdam edition.

(*x*) P. 254.

qual and intermitting, attended with frequent faintings, occurs only in the most inveterate scurvy; but he no where gives any state of pulse as peculiar, or an index to the disease. And although he lays great stress on the appearances in the urine (*y*); yet here he in some respect likewise differs from *Eugalenus* (*z*).

There is another very material difference in their accounts of this disease. *Eugalenus*, who, if we take his own word for it, had many more patients than ever fell to Dr *Willis*'s share, found it in his time very easy to remove (*a*). Accordingly, his book abounds with some very speedy and miraculous cures. But now the scurvy is become much more obstinate, proceeds from various and opposite causes, requiring very different methods of cure; and the simple antiscorbutics so much extolled by *Eugalenus*, are by no means sufficient to remove it.

Willis has also given a different account of this disease from all others; as will appear by comparing the symptoms described by each (*b*). It is very natural then to in-

(*y*) P. 256.

(*z*) P. 229.

(*a*) *Cognito morbo, facîle curatur.* Eugalen. p. 140.

(*b*) Vid. Part 3.

E

quire,

quire, what singular and distinguishing marks and characteristics he has given of such a variety of distempers, in order to their being with any manner of propriety classed under one denomination, and referred to the disease we are now treating of. And they are as follows.

“ The signs of the scurvy are: First, Certain
 “ outward marks and circumstances, which
 “ give a suspicion of it, until the more certain
 “ symptoms appear. Thus, if one is born of
 “ scorbutic parents, has been conversant with
 “ a scorbutic wife, or other scorbutic compa-
 “ ny; lives near the sea, or in an unwholesome
 “ marshy place; has had a long fever, or o-
 “ ther tedious chronic diseases; or if he finds
 “ benefit from antiscorbutic remedies; such
 “ a person, disposed to be valetudinary, with-
 “ out having a fever, or certain signs of any
 “ other distemper, we may justly suppose to
 “ have contracted the scorbutic taint (*c*).”

But it shall be proved in another place (*d*), that the scurvy does not seem to be properly a hereditary malady, and that it certainly never is contagious or infectious. People living near the sea, in unwholesome damp situations, as well as those who are recovering from fevers and

(*c*) Cap. 3. p. 247.

(*d*) Chap. 4.

other ailments, are subject to many other diseases besides this: the former, (as in *Holland*), to anomalous agues, with very deceitful appearances. His argument, of their finding relief from antiscorbutics, shall be examined afterwards. But what he adds next, *viz.* their being free from a fever, is pretty extraordinary. *Eugalenus*, *Sennertus*, and most other authors, had included fevers in a special manner as symptoms of this disease, though *Willis* hardly makes mention of them. So that the marks he has given us as yet, are at best but doubtful and precarious, if not mostly false. He indeed hints a little at what others had spoke out more freely, when he concludes with *not having the signs of any other distemper (e)*.

He proceeds (*f*). “Secondly, The other
 “ signs of this distemper, are its immediate
 “ symptoms and effects. As these are mani-
 “ fold, they are commonly differently divided,
 “ and reduced into certain classes, *viz.* as they
 “ are proper to the scurvy, or common to it
 “ with other diseases; — or according as they
 “ occur in the beginning, increase, or state of
 “ the malady; — as they are external, or inter-
 “ nal; — or they may be distributed according

(e) *Absque alterius morbi certis indiciis.*

(f) Cap. 3. p. 247.

“ to the different parts of the body affected,
“ viz. the head, breast, *abdomen*, or the mem-
“ bers, and habit. And in this last manner
“ we have described them.”

Had he taken the first method he mentions, and described the symptoms proper and peculiar to this disease alone, as *Ecbthius* has done; — or the second method, that of describing it in its beginning, progress, and different stages, as the first and purest writers have all done; he might have given us some light into the matter. Whereas in his manner of delivering a detail of almost all distempers incident to the human body, in a progression from the head to the foot, without any distinguishing marks to know when they proceeded from the scurvy, and when from other causes, he has acted much more irrationally than *Eugalenus*; who, although he ascribes as many diseases to the scorbutic taint, yet gives the peculiar characteristics of pulse and urine proper almost to each; by which they may be known to proceed from that, and no other cause. But this Dr *Willis* no where does.

It may be asked then, What idea this author had of the scurvy? This we can only guess at
from

from one passage of his book (*g*), where he pretends to deliver the discriminating marks of some particular scorbutic diseases, *viz.* palsies, convulsions, *vertigo*, dropfies, tumors, and ulcers; and which conveys to us the only notion he seems to have had himself of this disease, if we lay aside his theory; which can never be admitted, until we know what he wants to account for by such a new and extraordinary hypothesis as he there advances.

He makes the principal diagnostics of these scorbutic diseases to be the two following.

First, Their yielding chiefly and principally to antiscorbutic medicines. If he hereby means only the simple and most approved antiscorbutic herbs, scurvy-grass, brook-lime, and cresses; in this case he will gain as little credit as *Eugalenus*, who asserts, that in palsies, convulsions, lethargies, dropfies, &c. they have extraordinary virtues. The daily experience of practitioners convinces us of the contrary. But this author cannot mean only the simple and common antiscorbutics. There is here a greater absurdity than may appear at first sight. His book abounds with the most various indications of cure, and with a great num-

(*g*) Cap. 5. p. 274.

ber of antiscorbutic remedies of the most opposite virtues. He desires, that when one of these does not succeed, we should try another, and another, until such time as we luckily fall upon something which may give relief (*b*). For this purpose, he furnishes us with as many different receipts as are sufficient to compose a *pharmacopœia*. Yet, after all, makes the cure a proof of the disease. It is surely less so of the scurvy, as he has described it, than of any other disease he could have well mentioned; and is, without some other signs, an indication of no particular one whatever.

He is pleased, however, to give us but one other mark of distinction, which he places in the formal cause, as he terms it (*i*). And his meaning seems to be, that in the scurvy, the blood and other juices are principally affected and vitiated, without any fixed disease, defect, or obstruction in the solids. So that here he would say there is no topical disease in any part of the body, especially the *viscera*; but a scorbutic dyscrasy of different sorts, sometimes in the blood, and at other times in the animal spirits.

It must be owned, this is a distinction ex-

(*b*) P. 277.

(*i*) P. 274.

tremely

tremely nice and subtle. One would willingly be informed, how it is known, when in palsies, dropsies, and such diseases as he there mentions, the cause is only in the fluids. Is it not absurd to characterise scorbutic ulcers and tumors in that manner (*k*)? But he saves the trouble of going farther on this head, by contradicting himself immediately after, or at least making this distinction hold only betwixt a beginning, and confirmed (or, as he calls it, a deplorable) scurvy (*l*).

Towards the close of his book, he opens a little the mystery to us, in the relation of the case of a nobleman, which seems to have been as different from the scurvy as from the pox. “As this case cannot properly be referred to any other disease, it may justly be deemed scorbutic (*m*).”

Dr *Willis* is copied by most of the succeeding authors, especially by *Charleton*; by *Hoffman*, in the distribution of the symptoms; and by *Boerhaave*, in the grand distinction into a hot and cold scurvy, in the process of cure, as also in the medicines prescribed for it. But these already mentioned, having been

(*k*) P. 274.

(*m*) P. 334.

(*l*) P. 275.

deemed

deemed the standard and original writers on this subject, I shall not trouble the reader with any farther animadversions upon them or their followers. I am persuaded, that many observations will naturally occur to those who peruse Part III. of this treatise with attention.

What were the sentiments of a most judicious physician, may be there seen by looking into *Sydenham*; what were the dreadful consequence of such writings, will appear by looking into *Kramer*: but how many unhappy patients must have suffered in this disease, before the slaughter of thousands at a time (*n*) began to open the eyes of mankind, is too melancholy a subject to dwell upon!

We are now arrived to a period of time, when many distinctions and divisions were introduced and made in the scurvy. An inquiry into the propriety of these, we shall make the subject of the following chapter.

(*n*) Vid. *Kramer*.

C H A P. II.

Of the several divisions of this disease, viz. into scurvies cold and hot, acid and alkaline, &c.

Authors had now gone on for near seventy years (*a*), by collecting from each other, and adding something themselves, to make up a very extraordinary number of scorbutic symptoms. They had ascribed to this modern calamity, almost every distemper or frailty (*b*) incident to the human body; so that no room was here left for farther invention. It became afterwards absolutely necessary, and was a sufficient task for their ingenuity, to make distinctions and divisions of it.

The daily experience of practitioners, and their observations in physic, must soon have convinced them of the inefficacy of one uniform method of cure. The simple anti-scorbutics, how much soever extolled by *Eugalenus*, failed to remove the many various and complicated disorders that were classed under

(*a*) From *an.* 1604, when *Eugalenus* wrote.

(*b*) *Omnes qui ex senio moriuntur, moriuntur etiam ex scorbuto.*

Dolæus.

the name of *scurvy*. Thus they found themselves under a consequent necessity of having recourse to different distinctions at first, divisions and subdivisions afterwards, of the malady. And as the *Materia medica* abounded with antiscorbutics of different and opposite virtues, taken from all parts of the animal, mineral, and vegetable kingdoms, it was proper to distinguish for what particular symptoms, diseases, or stages of the disease, each was peculiarly adapted.

But it may be asked, In what disease did such distinctions become so necessary? And it evidently appears, in that alone *which was first described by Eugeleus, and from him transcribed by Horstius and Sennertus; and has been described by Willis, and his copier Charleton;* who have always been esteemed the principal and standard authors on the scurvy. But if the critical remarks that have been made upon these original authors be found true, the distinctions made here are founded in absurdity; and the former chapter is a sufficient confutation of them.

These indeed, when first introduced by *Willis*, were not universally received. *Chamæau*, with great strength of reason, confutes

Willis's

Willis's hypothesis; as many others have done. *Maynwaringe* upon this occasion observes, that there is no essential difference in scurvies; but that the scurvy (*quasi genus morborum*) hath a latitude and extent more than any specific difference.

However, after all, those who have made the most distinctions of these diseases, seem to have acted most rationally. In which *Gideon Harvey*, physician to King *Charles II.* has exceeded all others. He observes, that here the exactest distinctions are requisite. These (he says) are to be taken, “ 1st, From its growth
“ or different stages; in which case, it is ei-
“ ther a *preliminary, liminary, recent, invete-*
“ *rate, or terminative scurvy*; the last of which
“ is the disease into which it passes, and
“ puts a termination to the distemper, or life
“ of the patient.

“ 2^{dly}, From its origin; in which respect it
“ is either *hereditary and connate*, when deri-
“ ved from the parents; or *adventitious*, when
“ got some time after being born: and this
“ last is either *contagiously adventitious*, when
“ got by infection; or *non-naturally adventi-*
“ *tious*, when contracted by some error in the
“ non-naturals.

F 2

“ 3^{dly},

“ 3dly, From the part chiefly affected, this
 “ disease may be named an *hepatic, splenetic,*
 “ or *stomachic scurvy.*

“ 4thly, From the internal cause, it may be
 “ termed either an *acid, or lixivial scurvy.*

“ 5thly, From the parts where the symp-
 “ toms concentrate, or from some predomi-
 “ nating symptom, it often takes a particular
 “ name; as, a *mouth scurvy, leg scurvy, joint*
 “ *scurvy, an asthmatic scurvy, a rheumatic scur-*
 “ *vy, a griping scurvy, a diarrhæous scurvy, an*
 “ *emetic or vomiting scurvy, a flatulent hypo-*
 “ *chondriac scurvy, a cutaneous scurvy, an ul-*
 “ *cerous scurvy, a painful scurvy,” &c. To*
 which a *face scurvy,* and many others, may be
 added.

“ 6thly, It may be distinguished into a *la-*
 “ *tent and manifest scurvy.* The first is made
 “ known by no external or manifest symp-
 “ toms; only a neutrality is observable in point
 “ of health, a defect of appetite, laziness, dul-
 “ ness, &c.

“ 7thly, It is either a *mild or malignant*
 “ *scurvy, an English or Dutch scurvy, a sea*
 “ *or a land scurvy, &c.”*

This writer and *Charleton* are almost the on-
 ly authors who deliver the symptoms peculiar

to the different kinds of scurvies, by which they may be known and distinguished from each other. Whereas others found this a task too difficult for them; and that it was much easier to give a long detail of symptoms and diseases; leaving it to the sagacity of their readers to apply fewer, more, or all of them, to the different species of scurvies constituted by them. For this purpose, it was alone sufficient that their theories were rightly understood; as when the sulphurs abounded in the blood, and when they were depressed; when this vital fluid was too hot or cold, or inclined to an acid, alkaline, and briny acrimony, or an oleous rancidity.

The first and best authors (*c*), whose method of cure was simple, uniform, and for the most part successful, having consequently no occasion for such various distinctions, universally ascribed the malady to a fault in the spleen. They mistook this disease for a very different one described by *Hippocrates* (*d*). But it being supposed, that the scurvy since

(*c*) *Ronssæus, Wierus, Echthius, Albertus, Bruccæus, Brunnerus, &c.*

(*d*) Vid. part 3. chap. 1.

their

their days, had by contagion (*e*) diffused itself over the whole world, infected the child unborn (*f*); and that few escaped this modern calamity (*g*); (as a pimple appearing on the skin, was thought to indicate this mischief lurking in the blood); to support these ill-grounded conceits, theories were invented, galenical, chymical, and mechanical, according to the whim of each author, and the philosophy then in fashion.

First, The galenical qualities of heat and cold, which *Willis* defines a *sulphureo-saline*, and a *salino-sulphureous state of humours*; and which the more modern writers have distinguished by the appellation of *alkaline* and *acid scurvies*, were introduced; and the distinction continues to this day. By which they mean, that the scurvy occurs in different habits and constitutions, or at different times; proceeding from as opposite causes as can well be imagined; as from heat and cold, or the hostile and

(*e*) *Tacitè serpit insidiosum virus ab hospite in hospitem; spiritus, lecti, mensæ, poculorum communione.* Charleton, p. 17.

Contagium celere. Boerhaave.

(*f*) *Fuere qui liberis suis scorbutum legarent jure possidendum hereditario.* Charleton, p. 17. Vid. *Willis*, p. 242.

(*g*) *Nemo ferè hodie ab eo planè immunis existit.* *Dolæi Encyclopædia.* See chap. 1. p. 30.

repugnant

repugnant qualities of an acid and alcali: and accordingly the different kinds of it require the most different methods of cure; what proves salutary in one species, being experienced hurtful, nay, poisonous in another. This was the consequence of *Eugalenus's* book, and other like writings.

It must be owned, the general name of a disease does not always lead us to the true nature of it. The habit of the body, and many other circumstances, are carefully to be examined; as also, the different degrees and stages of it, together with whatever other specialties may occur, in order to furnish just prognostics, proper indications, and a rational method of cure. But the divisions and distinctions that have been made here, are not only altogether unnecessary and perplexing, but have a pernicious tendency to confound it with other diseases, between which there is not the least analogy to be found.

The term *cold* or *acid scurvy*, is often met with in conversation, and frequently in the writings of very great physicians. Now I take it for granted, that they who use this term, do it in the same sense as the most eminent writers on the scurvy who first introduced it, and have explained

explained its meaning. It will therefore be sufficient for our purpose, to shew in what sense it was understood by *them*, and indeed by all who have attempted to explain it.

Soon after *Eugalenus's* book was published, it was found he had described in it many symptoms of the hypochondriac disease. Accordingly, *Sennertus*, in the preface to his so much esteemed treatise, which has been reputed the best on the scurvy, tells us, as an apology for having transcribed this author, that if we live in a country where the scurvy is not very common, we should at least learn from his book many symptoms of the hypochondriac disease. Yet what is surprising, this author, as well as all other systematic writers, has described the latter, in other parts of his works, as altogether different from the scurvy.

These authors, by confounding the two diseases, occasioned the utmost perplexity to succeeding writers on the subject. *Willis*, and all the followers of *Eugalenus*, maintain that the scurvy was nearly allied to the hypochondriac disease. But to set limits to both, and determine wherein they differed, puzzled authors not a little. Some thought they were so closely connected as not to be described separately

parately (*b*). The excellent *Riverius*, who knew little of this distemper but from books, conjectured it to be the hypochondriac disease, complicated with a certain malignity. Some were of opinion it was this last when beginning. But the more general notion of these mistaken authors (*i*) was, that the melancholic malady often terminated in the scurvy, as being the last and most exalted degree of it. The most judicious, such as Drs *Pitcairn* and *Cockburn*, (the last of whom especially had great opportunities of being acquainted with the scurvy), tell us plainly, that if any thing is meant by the term of a *cold scurvy*, it is nothing else but the hypochondriac disease. And any person will be convinced, that this is truly the case, by looking into *Charleton*; who must mean that, if he means any thing; and is the only writer of character who has distinguished the acid scurvy by its symptoms and cure (*k*).

But it is certainly paying too great a compliment to *Eugalenus*, to extend this denomina-

(*b*) *Estmullerus, Dolæus, &c.*

(*i*) *Moellenbroek, Barbette, Deckers, &c.*

(*k*) P. 40. He says, it is so nearly allied to the *melancholia hypochondriaca*, as to differ from it only in certain degrees.

tion to the hypochondriac disease, or any species of it; to pestilential fevers, cancers, buboes, &c. as he has done. Nor is it sufficient to alledge, that time and custom have given a sanction to such terms; as this is paying a deference to ignorance and custom, no ways consistent with the improvement of arts and sciences.

The hypochondriac distemper, according to *Sydenham* (1), is the same in men, that hysteric disorders are in women. In this, with some little variation, most physicians agree with him. But such diseases have no manner of connection with the scurvy: their seat and cause in the human body, and especially their symptoms, are widely different; so that there is hardly to be found one constant symptom in either, which is common to both.

IT is indeed surprising, that some very eminent authors should have endeavoured to persuade us, that from such opposite causes, as heat and cold, or alkaline and acid salts abounding in the body, not only the same series of symptoms should arise, (for if they do not, they should certainly have noted which were

(1) Vid. *Differ. epistol. ad Gul. Cole.*

peculiar to each), but that then likewise the same state of the blood should also exist. Thus, the learned *Boerhaave* and *Hoffman*, after giving a regular detail of symptoms, wherein they widely differ from each other, both agree in assigning one only immediate cause of all scurvies; which they suppose to be an extraordinary separation of the serous part of the blood from the *crassamentum*; the former being dissolved, thin, and acrid; whilst the latter, or the grumous part, is too thick and viscid. From the predominancy of different acrimonious salts, or oils (*m*), in this serum, the scurvy was to be denominated, according to *Boerhaave*, either *muriatic*, *acido-austere*, *fætid-alcaline*, *rancid-oily*, &c. (*n*)

It

(*m*) *Vix equidem plura sulphurum saliumque genera in hermeticorum ergasteriis, quàm in sanguine scorbuticorum est reperire.* Charleton, p. 58.

(*n*) *Boerhaave* having described the symptoms peculiar to the beginning, progress, and end of the malady, it may be asked, To which of the different scurvies are the symptoms (*Aph.* 1151.), and their so regular progression, to be applied? It would appear, to all of them, not only by his description in this manner, but by the prescriptions in his *Materia medica*; where, for example, putrid gums, the pathognomic sign of the malady, as will afterwards be shewn, are supposed to occur both in the hot and cold scurvy, which are the most opposite species of the disease. Vid. *Aph.* 1163.

It were to be wished, after having laid down as the sole immediate cause of all scurvy whatever, however different in other respects they might be from each other, such a broken

The whole indeed consists of scraps taken from different authors. He has picked the symptoms out of one book, *Sennerius's* collection, as he acquainted the pupils in his lectures; the cure out of another, *viz. Willis*. But it will appear to any person who peruses the authors from whom he has borrowed the description of the symptoms, *viz. Ecbtbius, Wierus, &c.* that they described a very different disease from what *Willis* did. Dr *Willis's* method of cure may perhaps be rationally applied to the diseases he described; but is by no means adapted to the disease characterised by the first writers on the scurvy.

I have been told, that *Boerhaave* has described a *cacochymia* under the appellation of *scurvy*. But if any thing else is meant besides a scorbutic *cacochymia*, which must be the same thing as the disease called *scurvy*, why misapply and confound terms? This must occasion a confusion of the things themselves; and hath produced very dreadful consequences, of which I will give but one instance. Mercury may be reputed a poison in the scurvy; *Kramer* gives an account of 400 men destroyed by it, (See Dr *Grainger's* letter, part 2. cap. 2.): yet *Boerhaave* recommends it; and in such a state of the malady (*Aph. 1151. n. 4.*) where it must certainly become a very deadly one. This fatal mistake has been copied from him, and even enforced by his authority. See *Heucher*.

It is true, he says, what is proper for one scurvy, is a poison in another. But this is not easily reconciled with the causes he assigns of the disease; all which (except the *cort. Peruv.* which is a good antiscorbutic) would seem, either separately or jointly, to produce similar effects. Let us suppose, for a moment, they produced very different effects; what criterion have we to distinguish, by his aphorisms on this disease, a poisonous from a salutary medicine? As I have before observed, he delivers

broken texture in the blood, and a remarkable separation of the serum from the grumous part, with so great an acrimony in the first alone, that those learned authors had furnished us with some better reasons for this opinion. Here we must have recourse to the first author of this hypothesis, *Moellenbroek*, in his book *De varis, seu arthritide vaga scorbutica*.

But it may be proper, before we go farther, to remark, that this writer has taken upon him to describe a disease as scorbutic, which *Wierus*, the first who mentions it, had described as

livers the most regular uniformity of appearances; and the pathognomic signs seem to be the same in every species of scurvy.

To so great an authority, which, as far as is consistent with truth and the good of mankind, I shall always respect, may be opposed a much greater, *viz.* the experience of a physician who had the greatest opportunity perhaps any one ever had, of being conversant with scorbutic patients; woful experience gained by being witness to the death of many thousands, when *Boerhaave's Aphorisms* on this subject were of no use to him! *Non nisi unica species veri scorbuti datur, eaque foetida, putrida, &c. Gravissimus est error, quamlibet cacochymiam, imo etiam cachexiam, &c. scorbutum putare, quum verus scorbutus species cacochymiae singularis sit.* *Kramer* epistol. p. 27. 28. Such indefinite terms are indeed but a subterfuge for ignorance, and have been long a reproach to the art of medicine. *Antiquorum cacochymia, et modernorum scorbutus, æqualia habent fata; nam nomen suum in omnibus illis affectibus dare debent, ubi causæ morborum et symptomatum nullo alio vocabulo exprimi possunt. Et sic tanquam asylum ignorantiae hæc nomina consideranda veniunt.* *Junckeri conspectus medicinæ, tab. 69.*

a very different one, in a treatise *De morbis aliquot hætenus incognitis*; in which he tells us, the one was peculiar to the people of *Westphalia*, the other to *Holland, &c.* *Forrestus*, upon receiving an account of the *die varen*, from *Henricus a Bra*, ingenuously owns, that in fifty years practice it had never occurred to him. He thinks it a new disease, and very different from the scurvy (o).

Now it is this author, in his account of what he calls *the scorbutic wandering gout*, who (p) makes the immediate cause of the scurvy to be a volatile scorbutic salt. He observes, that this salt must needs be volatile, otherwise it would too tenaciously adhere to the parts, as in the true gout; and the pains would not move or shift so suddenly as they do in the scorbutic gout (q): and for the same reason it must reside in the serum alone, as the most proper vehicle to circulate it so quickly. This the other viscid humours with which scorbutic habits abound, as is plain from the blood taken from their veins, cannot be supposed to do. He afterwards assigns these

(o) Vid. Obs. medicinal. lib. 20.

(p) P. 11.

(q) P. 12.

viscid humours as the cause of the putrid gums and some other symptoms (*r*).

The celebrated Professor *Hoffman* (*f*) makes use of pretty much the same arguments. He judges the salivation, flying pains, and hæmorrhages usual in this disease, to proceed from the thinness and acrimony of the *serum*, and its separation from what he calls the solid parts of the blood; and the more fixed pains, tumours, &c. to arise from the viscosity or *lentor* of the latter.

But the truth is, there is no such state of blood in this disease. It is indeed contrary to reason, to suppose, in so high a degree of putrefaction as appears in scorbutic cases, that the *crassamentum* of the blood should continue thus thick and viscid; which, by all experiments made on putrified blood, appears quickly to be dissolved and thinned by corruption (*t*). It certainly is so in all putrid dif-

(*r*) P. 18.

(*f*) Medicin. systematic. tom. 4. part. 5. cap. 1.

(*t*) By Dr *Pringle's* experiments, not only the *crassamentum* of the blood is the first resolved by putrefaction, which the *serum* resists for a much longer time; but the septic or putrid particles seem principally to be intangled in the grume: so that such acrimony would appear to reside chiefly there, by experiment 42. Vid. Appendix to Observations on the diseases of the army.

cases.

eases. This is further made evident to a demonstration, by the dissections afterwards to be related (*u*); or, if these be liable to objections, from the appearance of the blood in Lord *Anson's* scorbutic crew while alive (*x*); which in every stage of the disease, and from whatever part of the body it was discharged, was always found in a different condition: the *crassamentum* was altogether dissolved and broken; and there was not so much as any regular separation (*y*), much less such an extraordinary one, as has been by some made the only immediate cause of the scurvy, the basis of a theory, and of a practice founded upon it.

The assuming likewise the chymical principles of acid and alkaline salts, as the foundation of a method of cure, from a presumption of the predominancy of such salts, or of an acid or alkaline tendency in the blood in this disease, is exceptionable on many accounts.

We may allow the predominancy of such salts, or the existence of such an humour in the *primæ viæ*, as may be supposed to have the

(*u*) Part 2. chap. 7.

(*x*) Ibid.

(*y*) This is confirmed by *Kramer*. See Part 3. and Dr *Grainger's* observations, chap. 5. part 2.

physical marks and properties of what is said to be acid or alkaline. But as the blood of no living animal was ever found to be either acid or alkaline (z), it is hard to grant the existence of such qualities, latent and occult there, when they do not manifest themselves by any signs in the body, from which we can be assured of their existence. These, according to all the authors of such theories, ought principally to be in the first passages. But, in the highest degree of the hot, putrid, and what is called the *alcalescent scurvy*, there is generally neither loss of appetite, putrid belchings, nor any other marks, delivered by those authors, as proofs of an alcalescent tendency in the stomach and intestines; nor is there commonly any præternatural thirst, or heat of the body, supposed always to accompany an alcalescent state in the blood. On the contrary, such

(z) Although the recent urine of those who took Mrs Stephens's medicine was found to effervesce with acids, yet this experiment by no means authorises us to conclude that the blood of such people was alkaline, for very obvious reasons. It however furnishes one of the strongest arguments against the opinion of putrid scurvies being of an alcalescent nature; as pills made of soap, garlic, and squills, was the common medicine given by our most experienced navy-surgeons, and used at several hospitals, particularly at *Gibraltar*, for recovery of many thousand seamen half-rotten in this disease.

H

people

people have for most part a good appetite, without any heat or drought, even till their death.

One would naturally have expected here, especially in the *muriatic scurvy*, as it is denominated, (which in another place shall be proved altogether a chimerical distinction), a violent thirst, a vehement desire of aqueous and diluting liquors. These also would seem the most rational and effectual remedies, in such a saline state of blood, at least upon chymical principles. Accordingly, a great chymist, *Hoffman* (*a*), though he admits different salts in the blood as the cause of scurvies, observes, that nothing can be so ridiculous as the laboured and anxious pains taken to correct these by opposite salts. “For (says he) I will
“ prove it to a demonstration, there is but one
“ way, and it is the most effectual and safest,
“ to correct morbid salts of any kind; that is,
“ by diluting them sufficiently with water.” His reasoning is at least plausible, it being certain water is the proper menstruum and solvent of all salts.

The terms of *acid* and *alkaline*, have not indeed been sufficiently defined and restricted, so

(*a*) *Medicin. ration. system.* tom. 4. part. 5. cap. 1.

as to be a very solid foundation for any theory of diseases (*b*), beyond those of the *primæ viæ*. For even such as are generally deemed of either class, though obtained in their utmost purity, are found to differ extremely from each other in their properties, more especially in their effects upon the human body (*c*); as unfermented and fermented, vegetable and fossil acids do; some coagulating, others attenuating the blood. Thus likewise, volatile and fixed alcalies differ extremely, though pure. But this purity being seldom attainable, their virtues and properties are still infinitely more varied, according to the manner of their preparation, and their different and various combinations with other substances.

But to bring this matter to a conclusion: Such theories are entirely overthrown, upon having recourse to experience, the only test by which they must stand or fall. We find in practice, that in such hot, putrid sea-scurvies, as have

(*b*) *Frustra quærimus limites quibus utralibet species contineri debeat. Hinc quàm rectè ii faciant, non difficilis est conjectura, qui theorias, non chymicas modò, sed et medicas, ex acidorum alkali-umque doctrina confingunt; dum ne vocabulorum quidem vim intelligunt.* Jo. Freind prælect. chymic. p. 12.

(*c*) Vid. Hoffman. observ. physic. chymic. lib. 2. obs. 29. et 30.

been referred to the alkaline class, the hot alkalifcent plants, viz. cresses, onions, mustard, and radishes, prove serviceable. These, from such theories, have been condemned by authors, as noxious and pernicious in the highest degree. But the contrary is demonstratively evinced, by the deplorable case of the sailor left behind at *Greenland*, related by *Bachstrom* and others, who was cured by scurvy-grass alone (*d*); and by the experience of all our naval hospitals, where the most high and putrid scurvies are daily removed by fresh flesh broths; wherein are put great quantities of celery, cabbage, colewort, leeks, onions, and other alkalifcent plants. In such cases all acid fruits and herbs are likewise experienced to be of great benefit. So that the uncertainty of such theories plainly appears. And they ought the more now to be disregarded, as putrid substances and alkalines are proved by experiments to be different (*e*). Yet it was upon a supposition of their bearing

(*d*) Though it is not so acrid as our scurvy-grass, yet it has a tendency that way. See Mr *Maude's* letter concerning the *Greenland* scurvy-grass, part 2. chap. 5.; which is a sufficient confutation of the vulgar error, that acids alone are proper in putrid scurvies.

(*e*) See Dr *Pringle's* experiments read before the Royal Society.

a great similitude to each other, or being properly different degrees of the same thing, that this theory was first devised. Upon the faith of which, many improper chymical preparations, and especially opposite salts highly extolled in such cases, have been recommended and administered in the scurvy, to the manifest detriment of the patient. Be it remembered, *Chymia egregia ancilla medicinæ, non alia peior domina.*

C H A P. III.

Of the distinction commonly made into a land and sea scurvy.

THis disease has been always most common at sea. It is well known there in the present age, by reason of the frequent voyages to the most distant parts of the world. The symptoms, though numerous, are yet observed to be regular and constant; so that the most ignorant sailor, in the first long voyage, becomes well acquainted with it. But as many were supposed to die at land of the scurvy, though none of the most equivocal and uncertain,

tain, much less the usual symptoms of the marine disease, appeared; it became necessary, in order to save the credit of the physician, and to justify his opinion of the disease, to pronounce it *the land-scurvy*, or a species of scurvy different from that at sea.

This is a distinction often made in conversation, and sometimes in books. In order to judge of the justness and propriety of it, we shall here consider, what certainty we have that this distemper is the same on both elements; and what particular proof can be brought at any time, to ascertain the identity of two diseases, afflicting different persons, in different climates, and at different times.

The phænomena or appearances in any disease, which are obvious to our senses, or by their assistance may be made evident to our reason, are the symptoms or diagnostics of it. Whether they be the immediate causes or effects of the malady, they are properly called *symptoms*; a symptom being part of the disease; and the whole symptoms taken together constituting the whole disease; from the aggregate or assemblage of which we draw conclusions.

Such appearances or symptoms, then, as are peculiar to the nature of the malady, and are
more

more constantly experienced to accompany it, are called *pathognomonic* or *demonstrative signs*; and these constitute the greatest medical evidence which can be obtained of the existence and identity of diseases. Besides which, it is a corroborating proof of their identity, if they proceed from similar causes: And, lastly, if they are removed by the like medicines or method of cure.

1st, As to the pathognomonic signs of this disease: If we compare its symptoms as described by *Echthius*, *Wierus*, and all other authors till the time of *Eugalenus* (*a*), with the accounts given of them in books of voyages, particularly the extraordinary narrative of what happened to the great Lord *Anson's* crews in their passage round the world (*b*), we shall perceive an entire agreement in the essential signs of the distemper, (making a proper allowance for the different descriptions that may be expected from seamen and physicians), and appearances so singular as are not to be met with in any other. Thus, putrid gums, swelled legs, and spots, accompanying each other, and in their progress usually attended with rigid tendons in the ham, are observed in no other distemper.

(*a*) Vid. Part 3.

(*b*) Ibid.

It is also peculiar to it, that persons thus afflicted, though otherwise apparently healthful, are upon the least motion, or exertion of strength, apt to faint, and do often suddenly drop down dead.

This evil the medical writers have described as peculiar to certain countries. They tell us of its being epidemic one year over all *Brabant* (*c*); some years in *Holland* (*d*). *Forrestus*, though he had frequent opportunities of seeing it in sailors, yet in all his histories gives us but one case of a mariner. His most faithful accounts of this malady, are illustrated by patients who had always lived at land; some of whom must have been infected in a very high degree, when they dropped down dead suddenly, to the surprise of their relations; of which he gives an instance. *Dodonæus* (*e*), a very accurate writer on the scurvy, relates no cases of it in sailors, but in people on shore, particularly in a person who contracted it in prison (*f*).

(*c*) *Dodonæus, Forrestus.*

(*d*) *Ronssæus.*

(*e*) *Praxis medic. et observationes.*

(*f*) Yet elsewhere, *Angli maritimis commerciis dediti, et nau-
tæ potissimum, stomachace affliguntur. Sive id fit cerevisiæ potu ex
palustribus aquis coctæ, sive ex aëris putredine, cœlique nebulis aut
vaporibus, hujus nostri instituti explicare non est. Historia stirpium.*

It

It is indeed remarkable, that the first just description published of this disorder in *Europe*, was in an account of its raging in besieged towns, by the historian *Olaus Magnus* (g), where it was attended with such symptoms as occur always at sea. We have likewise about the same time a very elegant picture of it drawn by *Adrian Junius*, a physician and historian in *Holland*, cotemporary with *Ronsseus* (h).

Moreover, the sea-scurvy is called by several authors *the Dutch distemper*; especially by the celebrated *Francis Gemelli Careri*, who has wrote the best voyages in the *Italian* language. And indeed the symptoms of the malady are at this day uniform and the same, both at sea and land; in *Holland* (i), *Greenland* (k), *Hungary* (l), *Cronstadt* (m), *Wiburg* (n), *Scot-*

(g) Vid. Part 3. chap. 1.

(h) *Hollandiæ itaque peculiari dono Natura dedit proventum lætum Britannicæ herbæ, (which he afterwards calls cochlearia), quam præsentanei remedii vim præbere in profliganda sceletyrbe et stomachace experiuntur, cum incolis, exteri quoque: quibus malis dentes labuntur, genuum compages solvitur, artus invalidi fiunt, gingivæ putrescunt, color genuinus et vividus in facie disperit, livescunt crura, ac in tumorem laxum abeunt.* Histor. Bataviæ, cap. 15.

(i) Vid. Dr *Pringle's* observations on the diseases of the army, p. 10.

(k) Act. Haffnien. vol. 3. obs. 75.

(m) *Sinopæus.*

(l) *Kramer.*

(n) *Nitzsch.*

land (o), &c.: which sufficiently evinces the absurdity of the assertion advanced by several authors, that since the first accounts of it were published, the face and appearances of the calamity have been greatly changed.

2dly, As to the causes of this disease; they are the same on both elements: for it will be fully proved (*p*), that there is not to be found any one cause productive of it at sea, which is not also to be met with at land; though such causes, by subsisting longer and in a higher degree, usually give rise to its greater virulence in that element.

It is indeed a sufficient and just confutation of many writers on the scurvy, that they pretend to describe a malady to which seamen are peculiarly subject, and which they say proceeds from the *nauticus victus*, putrid water, and sea-air. Yet their assertion, That the disease described by them, (*viz. Eugalenus (q)*, *Willis*, and their

(*o*) Vid. Dr *Grainger's* account of the scurvy at *Fort-William*, part 2. chap. 2.

(*p*) Part 2. chap. 1.

(*q*) *Eugalenus* practised at *Embsden*, and other places of *East-Friesland*; where the cold, thick, and moist air, the raw unwholesome waters used by the inhabitants along that tract of the sea-coast, and the *crassus et nauticus victus*, (as he terms it), occasioned the scurvy to be a universal disease. But it must be granted,

their followers), is properly a marine disease, is refuted by the observation of all practitioners at sea. And the same may be said of the different species of scurvies alledged by *Boerhaave* to proceed from the causes above mentioned.

But a heavier charge lies against them. When granted, that the scurvy never was so epidemic or fatal there as in ships and fleets. All the causes he assigns as productive of it, do subsist at times in a much higher degree at sea than at land. I have had 80 patients out of the number of 350 men afflicted with it; and have seen a thousand scorbutic persons together in an hospital, but never observed one of them to have the diseases described by *Eugalenus*. Nor did I ever hear of a practitioner at sea, where it would have been most allowable, who assumed his principles; and supposed, that almost all diseases there must be complicated with the scorbutic *virus*; that the most extraordinary and uncommon which occurred at sea, (as was supposed at *Emden* and *Hamburg*), were, this mischief lurking under deceitful appearances; and that such diseases could not be cured without a mixture of antiscorbutics, which seldom failed to remove them. This last, surely, could never have escaped the observation of our many ingenious navy-surgeons, and of our physicians and surgeons to naval hospitals; some of whom had seldom less than a thousand patients from the sea. *Mr Ives's* ingenious journal, (placed at the end of chap. 1. part 2.), is a proof of the variety of diseases which occur there, without the least connection with the scurvy. If it often killed the patient (as it would seem always to have done in *Friesland*) before the gums and legs were affected, or the spots appeared; this likewise must have escaped our observation. But though *Eugalenus* may be justly condemned as the parent of these absurdities, greater mischief, however, has been done by succeeding authors, from their digesting them into a system. Such remedies and cures have been directed, as are not only altogether unserviceable, but for the most part highly pernicious.

the true scurvy does really occur, their writings, so far from being useful, are rather hurtful to practitioners; which I think needs no farther proof, than *Kramer's* letter to the college of physicians at *Vienna*. Their doctrines have perverted the judgment of even some of the best writers. I shall instance only in *Sinopæus*. That author has taken his description of the disease from nature and observation; but, unluckily, his medicines from those authors; otherwise I am morally certain, the calamity would not have arisen to the height it did at *Cronstadt*, and usually does every spring; where it seems to be abated annually more by change of weather, than the skill of physicians.

3dly, The cure of scorbutic diseases contracted either at land or sea, is entirely the same. This will appear to any person who peruses *Backstrom's* and *Kramer's* observations, and several other histories related in this treatise. And every practitioner who has treated such cases, must be further convinced of it; as the first remedies which were casually found out by the vulgar, and are recommended by the first and purer writers on the subject, have preserved their reputation and esteemed virtues even to this day.

Lastly,

Lastly, If to such convincing proofs it may be necessary to add authority, I shall beg leave to quote a very great one. The learned Dr *Mead* (*r*) informs us, that incited by the extraordinary events published in Lord *Anson's* voyage, to make a full inquiry into this whole affair, he had not only the honour of discoursing with his Lordship upon it, but had also been favoured with the original observations of his ingenious and skilful surgeons; and, upon the whole, he found, that this disease at sea was the same with the scurvy at land; the difference being only in the degree of malignity.

IF objectors should reply, That tho' the sea-scurvy often occurs at land, and, as has been demonstratively proved, is the only disease that was described by the first writers on the subject, as a malady peculiar to the marshy and cold countries which they inhabited; yet that they, nevertheless, understand by what may be termed, in contradistinction to the other, a *land-scurvy*, a disease, or class of diseases, different from the appearance of the marsh or marine scurvy: then it is incumbent upon them, and would be much for the benefit of mankind, to define,

(*r*) Discourse upon the scurvy, p. 97.

describe,

describe, and characterise this singular species, and distinguish it from the appearances of the said disease, either at land or sea. This they must know has not been attempted by any author in physic. The greatest modern writers, *viz.* *Boerhaave*, *Hoffman*, and *Pitcairn*, have made no such distinction, either in the causes or diagnostics of the disease, nor indeed in any part of their description of it. And I mention these last, as having had a very extensive practice, besides the advantage of perusing all books wrote before them on the subject.

It may be said, That there are certain disorders, *viz.* many cutaneous eruptions, ulcers, a species of toothach, &c. which, for a considerable time, have passed under the character and denomination of *scorbutic*; a term introduced by our predecessors in the science, and which most practitioners have agreed to make use of at this day, and which there may perhaps be a necessity of retaining, as it is not easy to assign a proper appellation to every disease, or case of a patient.

This reason is commonly urged. In answer to which I shall, *first*, inquire, how or when this term came first to be so generally applied; or whence such ulcers, the itch, &c. were denominated

minated *scorbutic*? I think it will admit of no doubt, that it was first applied to such ulcers and eruptions on the skin as did not readily yield to the skill of the practitioner (*f*). Dr *Musgrave* (*t*) informs us, that all *Europe* was so much alarmed with the apprehensions of this evil in the last century, as appears from the *Recipe's* of practitioners in those times, that the whole art of physic seems to have been employed in grappling with this universal calamity, which was supposed to mingle its malignity with all other diseases whatever (*u*). Thus the term was originally imposed through ignorance, and a mistaken opinion of the prevalence of the scurvy. There would indeed be some difficulty in conceiving how men of such wild fancies, as were they who have been deemed the principal authors on the scurvy, and to whom we are indebted for this general name, could ever get into possession of that degree of fame which they have acquired, did we not experience how much the world is disposed to admire whatever surprises; as if we were endued with faculties to see through or-

(*f*) *Vid.* Sydenham.

(*t*) *De arthritide symptomatica*, p. 98.

(*u*) *Vid.* note, p. 30.

dinary follies, while great absurdities strike with an astonishment which overcomes the powers of reason, and makes improbability even an additional motive to belief. There are few now who set so small a value upon their time, as to read these authors; and by that means their merit is little examined into, and is admitted upon the credit of others.

2dly, If it be urged, That the denomination of such diseases ought still to be retained, as being now generally adopted; I answer, That, upon the same principles, the most ridiculous terms in any art may be vindicated. Lord *Verulam*, and the first reformers of learning in *Europe*, met with this very objection. The learned ignorance of that age lay concealed under a veil of unmeaning, unintelligible jargon. But, in order to make way for the restoration of solid learning, it was found necessary to expunge all such terms as were contrived to give an air of wisdom to the imperfections of knowledge.

It may be believed, that there are few people who have had opportunities of reading more upon this subject than I have done; and that there are few books or observations published upon the disease, that have not fallen under
my

my inspection. If I could, with any manner of propriety, have characterised any other species of scurvy than that which is the subject of this treatise, I should have consulted the security of my character more, than in advancing an uncommon doctrine, as all novelties are exposed to opposition. But, in attempting a thing of that sort, I did not find two authors agree who founded their doctrine upon facts and observations. I observed, that ten different practitioners pronounced ten cases to be scorbutic, which, upon examination, did not bear the least resemblance or analogy to each other. Upon this occasion, I might have followed the example of some writers; and, disliking the former distinctions made, might have introduced others, accommodated either to the opinion of the country, and thus, by adopting vulgar errors, have endeavoured to establish and confirm them; or to some new principles; and so might have multiplied absurdities, in like manner as every private practitioner does, who thinks he has a right to term what he pleases a *scurvy*; though the propriety of the appellation cannot be justified from the acceptance of it, by the most authentic authors of

facts and observations, nor has any foundation in the genuine principles of physic.

It may be said, That the world would reap great advantage by having a compleat treatise of the causes, cure, &c. of the many diseases which commonly go under the denomination of the *scurvy*. But this is not an easy task: and it might as well be expected, that an author, who lived in a country, or at a time, when the most obstinate and uncommon appearances were ascribed to witchcraft, and had taken pains to banish such ignorant conceits, should be able to account for the various distempers and *phænomena* ascribed to that imaginary evil. It has been usual for ignorant and indolent practitioners, to refer such cases as they did not understand, or could not explain, to one or other of these causes; according to the observation of a very learned and late practitioner (x).

With regard to the necessity of retaining the name, as if an unmeaning term was as re-

(x) *Mos adè invaluit, ut hodie medici imperitiores, si quando ex certis signis neque morbum nec causam ejus ritè possunt cognoscere, statim scorbutum prætendant, et pro causa scorbuticam acrimoniam accusent. Deinceps non rarè accidit, ut adfectus quidam sæpe planè singularis, cui portentosa spastico-convulsiva junguntur symptomata, in artis exercitio occurrat; et tum usu receptum est, ut illam vel ad fascinum vel ad malum scorbuticum rejiciant.* Fred. Hoffman. med. systemat. tom 4. p. 369.

quisite in physic as pious frauds in certain religions: *Si vulgus vult decipi, decipiatur.* If the good of mankind will have no effect upon these gentlemen, I am afraid no other argument will. We shall however lay before them a view of the fatal effects produced by the use of such vague and indefinite terms.

1st, On young practitioners and students in physic; who being provided with such a general name as that of the *scurvy*, comprehending almost all diseases, think themselves at once acquainted with the whole art of medicine; as they may be furnished with numerous cures for it from the many Pharmacopœias with which the present age abounds.

2^{dly}, Older practitioners, by referring many various and uncommon diseases to such imaginary causes (*y*), deprive the world of the true improvement of their art: which can only be expected from accurate histories of different cases, faithfully and honestly stated; and distinguished from each other, with the same accuracy that botanical writers have observed in describing different plants. The ancients have been at great

(*y*) *Notandum est, quòd quando multa symptomata numerantur, tunc esse cogitandum de nomine congeriem morborum indicante, ut scorbutus.* Waldschmid praxis medicinæ rationalis.

pains to distinguish the diseases of the skin, which at this day make up a very numerous and considerable class, and have indeed treated that subject with prolixity. But the moderns have classed almost all of them under that one very improper denomination of the *scurvy* (z), even from the highest degree of the leprous evil, to the itch and common tetter; and with these have confounded the pimpled face, scall head, most cutaneous eruptions usual in the spring, the erysipelas, &c.; nay dysepulotic ulcers, especially on the legs, and various other ailments of the most opposite genius to the true scurvy, have been supposed to proceed from it. The different causes of which various distempers cannot be with propriety reduced

(z) Dr *Pringle* very justly observes the impropriety of the appellation of *scurvy* generally given to the itch, various kinds of *impetigo*, &c.; and remarks, that in the marshy parts of the *Low Countries*, where the true scurvy is most frequent, and of the worst kind, the itch is a distemper unknown. A real scurvy (says he) imports a slow, but general resolution or putrefaction of the whole frame; whereas the *scabies*, *impetigo*, or leprosy, will be found to affect those of a very different constitution. The true scorbutic spots are of a livid colour, not commonly scurfy, or raised above the skin, &c. Vid. chapter on the itch, in *Observations on the diseases of the army*.

In his Appendix he observes, that the muriatic and putrid scurvy are properly the same thing, and that the supposed species of acid scurvy is at least very improperly denominated.

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under any division of the scurvy as yet made, nor from thence the peculiar and distinct genius of each known and ascertained; which, however, is absolutely necessary towards undertaking their cure.

3dly, and lastly, It has a most fatal influence on the practice: Thus the original and real disease has been lost and confounded amidst such indefinite distinctions and divisions of it, that it is sometimes not known by the best practitioners, when it really occurs. *To this was owing the loss of so many thousand Germans in Hungary (a), not many years ago; where the physician to that army, together with the whole learned college of physicians at Vienna, assisted by all the books extant on the subject, were at a loss how to remedy this dreadful calamity.* And for this reason many unhappy people are daily injudiciously treated at land, as must have been observed by every one acquainted with the distemper. Thence likewise pernicious methods have been recommended at sea, and too often put in practice.

(a) Vid. *Krameri epistola de scorbuto.*

C H A P. IV.

Of the scurvy being connate, hereditary, and infectious.

VARIOUS have been the opinions concerning the causes and propagation of this evil. Some believed it to be connate, and the direful seeds of it transmitted from scorbutic parents, and that sometimes it was derived from a scorbutic nurse.

Horstius (a) had so very accurate a discernment, as to find, that the grandfather might infect a grandchild, though his own son escaped the infection. He ascribes the spreading of the contagion in *Holland* to the custom of salutation by kissing; and pities the poor infants, whom every person must salute, to avoid giving offence to the family. He is not at all surpris'd, that the calamity was so frequent in the *Hanse Towns*, and in the *Lower Saxony*, as they used but one cup at table; where there was rarely wanting some scorbutic person with rotten gums, who with his *saliva* might infect the whole company. *Sennertus* asserts

(a) *Tra&ctatus de scorbuto.*

it to be infectious from venereal embraces, and mentions an instance of its being communicated even from a dead body. *Boerhaave, Hoffman*, and almost all authors, make it a very infectious poison; and *Charleton* was of opinion, that more got it in this way than in any other.

Several of these chimerical opinions deserve no serious confutation. It is indeed far from being probable, that this is what may properly be called a hereditary or connate disease; as we seldom in practice see it rise to a great height, without the influence of some obvious external causes; and experience shews, that when the taint is but slight and beginning, it may for the most part be quickly and easily subdued.

It is a matter of more consequence, to be rightly informed whether it is really contagious, as hath been confidently asserted by most authors. The effect of contagious poisons can only be known *à posteriori*, and by no reasoning deduced *à priori*. So that these authors should have given us attested histories of persons infected in this manner, where the other causes that always produce the disease had no influence. But no such histories are to be found,

found. On the contrary, where-ever the calamity has been general, it was known to proceed from strong and universal causes; and, in the times of its most epidemical ravage, persons properly guarded against the influence of these causes, were not infected with it. Thus, when it lately raged with such a remarkable devastation among the *Germans* in *Hungary*, the physician to that army (*b*) was surpris'd to find, that not one officer, even the most subaltern, received the infection.

At sea likewise, where the frequency of the distemper gives the greatest opportunities of determining this point, it never has been deemed infectious. If it had been so, it could not there have escaped observation. Taught by fatal experience the speedy progress and great havock that all contagious distempers, *viz.* fevers, dysenteries, &c. make among a number of men so closely confin'd, it is common to use many precautions to prevent their spreading. They separate the diseas'd from the rest of the crew, destroy the bedding and cloaths of those who die, send immediately on shore patients afflicted with such diseases upon coming into port, and afterwards smoke and clean the ship.

(*b*) *Kramer.*

But

But long and constant experience having sufficiently convinced them, that scorbutic ailments are not infectious, no such precautions are ever taken. In slight cases, and even where the gums are very putrid, the men are often kept on board, and cured; there being no instance of such persons ever infecting the rest of the crew, or of those who are sent on shore carrying the infection into the hospitals; though, upon many other occasions, the patients in these hospitals suffer extremely by contagious diseases introduced amongst them.

In an epidemic scurvy at sea, the indisposition attacks, in a regular order, such people as are predisposed to it by manifest causes. It is for a long time confined at first to the common seamen: and though the officers servants are at such times often afflicted with it, while using the same cups and dishes with their masters; yet it is but rare to see this disease in an officer, nay even a petty officer.

I could produce many instances, and well-attested facts, which prove beyond all doubt, that drinking out of the same cup, lying in the same bed, and the closest contact, does not communicate this distemper. But to multiply proofs of a thing so universally known, is

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needless.

needles. Perhaps the following may suffice. A *French* prisoner was taken on board his Majesty's ship the *Salisbury* from a prize-vessel, with the most putrid scorbutic gums that I ever observed. The stench and putrefaction of his mouth were indeed intolerable, even at some distance. Yet though he eat and drank out of the same dish and cup with five of his companions for a fortnight, he did not infect one of them: they all arrived in harbour in perfect health.

Nor is this disease communicated by infection from those that die: for the dissections made at *Paris* (c), of the most putrid scorbutic bodies, do not appear to have produced any such effect.

From whence we may judge how much authors have been mistaken, when they imagined this dreadful calamity to have diffused itself by contagion over the whole world, after it had quitted its native seat in the cold northern climates.

(c) Vid. *Memoires de l'academie des sciences* 1699, p. 237.

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S C U R V Y.

P A R T II.

C H A P. I.

The true causes of the disease, from observations made upon it, both at sea and land.

THE scorbutic taint is induced chiefly by the agency of certain external and remote causes; which, according as their existence is permanent or casual, and in proportion to the different degrees of violence with which they act, give rise to a disease more or less epidemic, and of various degrees of malignity.

Thus, where the causes productive of it are general, and violent in a high degree, it becomes an epidemic or universal calamity, and rages

with great and diffusive virulence: as happens often to seamen in long voyages; sometimes to armies (*a*), very lately to the *German* soldiers in *Hungary* (*b*); frequently to troops when closely besieged, as to the *Saxon* garrison in *Thorn* (*c*), the besieged in *Rochelle*, as also *Stetin* (*d*): and at other times to whole countries; as in *Brabant*, in the year 1556 (*e*); and in *Holland*, ann. 1562. (*f*).

2dly, Where these causes are fixed and permanent, or almost always subsisting, it may be there said to be an endemic or constant disease; as in *Iceland*, *Groenland* (*g*), *Cronstadt* (*h*), the northern parts of *Russia* (*i*), and in most northern countries as yet discovered in *Europe*, from the latitude of 60 to the north pole. It was also formerly in a peculiar manner endemic in several parts of the *Low Countries*, in *Holland* and *Friesland*; in *Brabant*, *Pomerania*, and the *Lower Saxony* (*k*); and in some

(*a*) Vid. *Nitzsch*.

(*b*) Vid. *Kramer*.

(*c*) *Bachstrom*.

(*d*) *Krameri epistol.* p. 23.

(*e*) *Dodonæus*, & *Forrestus*.

(*f*) *Ronssæus*.

(*g*) *Herman. Nicolai. Vid. act. Haffn.*

(*h*) *Sinopæus*.

(*i*) Vid. *Commerc. literar. Norimb. an. 1734, p. 162.*

(*k*) *Wierus, Ronssæus, &c.*

places of *Denmark* (l), *Sweden*, and *Norway* (m), chiefly upon the sea-coasts.

Lastly, Where these causes prevail less frequently, and are more peculiar to the circumstances of a few, it may be there said to be sporadic, or a disease only here and there to be met with; as in *Great Britain* (n) and *Ireland*, several parts of *Germany*, &c.

Now, by considering the peculiarity of the circumstances, situation, and way of life of these people; and by attentively observing, what at any time gives rise to this disease, what is seen to remove it, and what to increase or mitigate its malignity, we shall be able to form a judgment, not only of the principal causes productive of it, but likewise of the subordinate; or those that in a less degree may contribute their influence. It is indeed a matter of the utmost consequence, to investigate the true sources of this evil; as, upon the removing or correcting of these, the preservation of the body from its first attacks, as well as its consequences, in a great measure depends. And

(l) Vid. *Concilium facultatis medicæ Hassn. de scorbuto.*

(m) *Bruceus.*

(n) Vid. *Dr Grainger's account of the scurvy at Fort-William.*

we shall begin with considering the situation of those at sea, among whom it is said to be so often an epidemic calamity.

In the proof of the identity of this disease on both elements (*o*), I observed, that the causes productive of it at sea, were to be found also at land, in a smaller degree: but before determining what are the true causes of its being so often epidemic at sea, it may not be amiss to remark what they are not, although commonly accused.

Many have ascribed this disease to the great quantity of sea-salt (*p*), necessarily made use of by seamen in their diet: and it has been therefore denominated a *muriatic scurvy*.

Whether this salt, instead of producing the scurvy, may not, on the contrary, from its antiseptic quality, become the means of preventing it for some time, I shall not take upon me to determine, as my experiments do not authorize this conclusion; though they plainly prove, that it neither causes the distemper, nor adds to its malignity. For in the cruises after mentioned, where the scurvy raged with great violence, it was then a fashionable custom to

(*o*) Part 1. chap. 3.

(*p*) *Listeri exercitatio de scorbuto.*

drink the salt water, by way of gentle phyfic. I have been told, that Admiral *Martin*, and several officers in his fleet, continued the use of it during a whole cruife. I had at that time several patients under a purging course of this water, for the itch, and obstinate ulcers on their legs; and have experienced very good effects from it, especially in the last case: yet none of these people, after continuing this course for a month, had the least scorbutic complaint.

But to put it beyond all doubt, that sea-salt is not the occasion of the scurvy, I took two patients, (in order to make trial of the effects of different medicines in this disease, to be more fully related afterwards), with very putrid gums, swelled legs, and contracted knees, to whom I gave half a pint of salt water, and sometimes more, every day for a fortnight: at the expiration of which time, I was not sensible of their being in the least worse; but found them in the same condition as those who had taken no medicine whatever (*q*). From which I am convinced, that sea-salt, at least

(*q*) This experiment, of giving scorbutic people salt water, has been often tried; and some have thought they received benefit from it. See chap. 4.

the drinking of salt water, by no means disposes the constitution to this disease.

But I would not be understood here to mean, nor does it follow from what has been said, that although sea-water, which is a composition in which this salt is a principal ingredient, has no bad influence upon the scurvy, that a diet of salt flesh and fish is equally innocent. The contrary of which will appear in the sequel. The brine of meats, in particular, is of a different quality from either purified sea-salt or salt water; for we find that this salt may be so intangled by the animal oils, especially in salt pork, that it is with great difficulty disengaged from them after many washings, and the most plentiful dilution. So that as this saline quality is inextricable from such food, it is rendered improper in many cases to afford that soft, mild nourishment, which is required to repair the body. It is remarkable, that the powers of the human machine can animalise other salts; that is, convert them into the ammoniacal sort, or that of its own nature: while this sea-salt seems to elude the force of our solids and fluids; and retaining its own unchangeable nature in the body, is to be recovered unaltered from the urine of those who have taken it.

it. Thus, sea-salt has no effect in producing this disease; whatever meats hardened and preserved by it may have, by being rendered of hard and difficult digestion, and improper for nourishment. And this is farther confirmed by the daily experience of seamen; who, upon the first scorbutical complaint, are generally debarred the use of every thing that is the least salted: notwithstanding which, the disease increases with great violence: While at other times, it breaks out when there is plenty of fresh flesh-provisions on board; as was the case in Lord *Anson's* ships, on their leaving the coast of *Mexico* (*r*).

Others, again, have supposed such to be the constitution of the human body, that health and life cannot be preserved long, without the use of green herbage, vegetables, and fruits;

(*r*) Vid. Part 3. chap. 2. Dr *Mead*, who was thoroughly acquainted with their situation, observes, that, upon that occasion, fresh flesh-provisions, and plenty of wholesome rain-water, did not avail them. *Discourse on the scurvy*, p. 100.

That salt flesh-meats have sometimes no share in occasioning this disease, is demonstrable from the many *Germans* in *Hungary* destroyed by it, who eat neither salt beef nor pork; on the contrary, they had fresh beef at a very low price. Vid. *Krameri epist.* p. 33.

The soldiers in the *Russian* armies also had no salt provisions. Vid. *Nitzsch*.

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and that a long abstinence from these, is alone the cause of the disease (*f*).

But if this were truly the case, we must have had the scurvy very accurately described by the ancients; whose chief study seems to have been the art of war; and whose manner of besieging towns was generally by a blockade, till they had forced a surrender by famine. Now, as they held out many months, sometimes years, without a supply of vegetables; we should, no doubt, have heard of many dying of the scurvy, long before the magazines of dry provisions were exhausted. The continuance of those sieges far exceeded most of our modern ones; even the five months blockade of *Thorn*, upon which *Bachstrom* has founded this supposition. It would likewise be a much more frequent disease in every country, than it really is: for there are persons every where, who, from choice, eat few or no green vegetables; and some countries are deprived of the use of them for five or six months of the year; as is the case of many parts in the highlands of *Scotland*, *Newfoundland*, &c.; where, however, the scurvy is not a usual malady.

It would be tedious to give many instances,

(*f*) *Observationes circa scorbutum; auctore Fre. Bachstrom.*

they

they being notorious, of ships crews continuing several months at sea, upon their ordinary diet, without any approach of the scurvy. I have been three months on a cruise, during which time none of the seamen tasted vegetables or greens of any sort; and although for a great part of that time, from want of fresh water, their beef and pork were boiled in the sea-water, yet we returned into port without one scorbutical complaint. I have known messes, as they are called, of seamen, who have lived, during a whole voyage of three years, on the ship's provisions, for want of money to purchase better fare, especially greens; and who were so regardless of health, as to expend what little money they could procure, in brandy and spirits: so that a few onions, or the like, was their whole sea-store; and a meal with vegetables was seldom eat by them, above twice or thrice in a month, during the whole voyage. Notwithstanding which, they have kept free from the scurvy.

But it was remarkable, in the two cruises afterwards to be mentioned, in his Majesty's ship the *Salisbury*, where I had an opportunity of making observations on this disease, that it began to rage on board that ship, and indeed

all the *Channel* Squadron, upon being less than six weeks at sea; and after having left *Plymouth*, where plenty of all sorts of greens were to be had; by which, as one would have thought, the sailors had sufficiently prepared their bodies against the attack of this malady. Yet here, in so short a time as two months, out of 4000 men in that fleet, 400 at least became more highly scorbutic (*t*), than could reasonably have been expected, had they all been debarred the use of vegetables for six months on shore, like our highlanders, and many others. And what puts it beyond all doubt, that the disease was not occasioned solely by the want of vegetables for so short a time, is, that the same ship's company of the *Salisbury*, in much longer crui-

(*t*) Upon the return of the fleet to *Plymouth*, Dr *Huxham* makes the following remark in the month of *July* 1746. *Terribilis jam sævit scorbutus inter nautas, præcipuè quos secum reduxit Martin, classis occidentalis præfectus. Excruciantur per plurimi ulceribus fædis, lividis, sordidis, ac valde fungosis: mirum est profectò et insolitum, quàm brevi tempore spongiosa caro, fungi ad instar, his ulceribus succrescit, etsi paulò antè scalpello derasa, eaque interdum ad magnitudinem enormem. Non solum miseris his, at verè utilibus hominibus, per se infensa est maximè scorbutica lues, sed et illos etiam omnipenè morbo, qui ab humorum corruptione pendet, obnoxios admodum reddit; febribus nempe putridis, malignis, petechialibus, pessimo variolarum generi, dysentericæ cruentæ, hæmorrhagiis, &c. Multo magis adeò bonis his fuit exitio quàm bellicum fulmen! Observatiões de aëre et morbis epidemicis.*

ses,

es, kept quite free from the distemper, where their circumstances as to want of fresh vegetables were similar. It was observable, that in the longest cruise she performed, while I was surgeon, there was but one scorbutical patient on board, who fell into the disease after having had an intermitting fever. We were out at that time from the 10th of *August* to the 28th of *October*; which was a twelve weeks continuance at sea, and consequently as long an abstinence from vegetables.

So that although it is a certain and experienced truth, that the use of greens and vegetables is effectual in preventing the disease, and extremely beneficial in the cure; and thus we shall say, that abstinence from them, in certain circumstances, proves the *occasional cause* of the evil: yet there are unquestionably to be found at sea, other strong sources of it; which, with respect to the former, (or want of vegetables), we shall hereafter distinguish by the name of the *predisposing causes* to it. The influences of which latter, at times, must be extremely great, as in the case of Lord *Anson's* Squadron in passing round *Cape Horn* (*u*), to induce so universal a calamity; from which hardly any

(*u*) Vid. Part 3. chap. 2.

one of them seems to have been exempted; attended with the mortality of above one half of them, when they had been but little more than three months at sea: while whole countries are observed to live on the same, nay, even a less wholesome diet; and many people for years abstain from vegetables, without almost any inconveniency.

Some have alledged this to proceed from something peculiar in the confined and polluted air of a ship; and the stagnation of the bilge-water in the hold has been accused as a main cause of the distress. But had this last the effects presumed, they would be most sensibly felt by those who are most exposed to it, *viz.* the carpenters; who at sea are often obliged to measure, every four hours, the quantity of bilge-water; and do then, and at other times in mending the pumps, suffer very great inconveniencies, being almost suffocated by it: nay instances are not wanting where they have been killed at once with this noxious vapour, to which they lie the nearest when in bed. Yet it does not appear from my own experience, nor from the accounts which I have been able to collect, that they are more liable to the scurvy than others on board.

As to any other inconveniencies from filth, or want of cleanliness, in a close place, and where the cutaneous and pulmonary perspiration of a multitude is pent up and confined; they are not peculiar to ships, but common to all crowded jails, hospitals, &c.: and whatever bad effects such a vitiated air may have on this disease, yet it is certain the scurvy is not the usual and natural consequence of it. This is the more particularly to be noted, in order to determine the genuine effects of this peculiar evil disposition of air; which are at all times, and in all places, a malignant, highly-contagious fever, known by the name of *the jail-distemper*. This is almost the only disease observed in the transport-ships which daily carry over numbers of people to *Virginia*, few or none of whom become scorbutic; as likewise in ships that have been crowded with soldiers. And, universally, whenever many persons are confined together long under close-shut hatches, they will at length contract this fever, without any approach of the scurvy amongst them; unless, as may sometimes be the case, the body, weakened and exhausted by the preceding sickness, is afterwards rendered more susceptible of the scorbutic taint, where
other

other scorbutic causes prevail. Though I have oftentimes had occasion to see this contagion bred by putrid air, yet I never observed any scurvies, either at the time, or after it.

In the latter end of the year 1750, the government contracted with a *Dutch* master of a vessel to carry over 200 *Palatines* to our colony in *Nova Scotia*. The brutal *Dutchman*, contrary to express orders, confined these poor people below, and would not permit them to come so often upon deck as was requisite for their health; by which means they contracted this malignant fever, which killed one half of them. And here it was remarkable, there was not one of these people who, after recovering at sea, or upon land, became scorbutic; nor had they any such distemper in the ship (*x*).

The

(*x*) Communicated by Mr *Ives*. This contagious petechial fever was as a plague to the ship *Dragon*, of 60 guns, and 400 men, for the space of six months. During which time I seldom or never had in my list less than sixty or seventy patients. Many of them relapsed to the third and fourth time. It was a dreadful, painful scene! Not a fifth part of our people escaped. My first mate, Mr *Blinco*, soon died in it. Another gentleman, whom our necessities obliged the Commodore to warrant as mate from another ship, died also. My other mate, Mr *Thomas Peck*, (present surgeon to the sick and wounded at *Deal*), narrowly escaped

The truth really is, a putrid air, though never observed solely to be productive of this disease, has a pernicious influence in aggravating its several symptoms: and where an epidemic scorbutical constitution at the same time subsists, they give rise to a complicated, scorbutical and malignant fever; which I shall have occasion to mention among the symptoms of this malady.

But the scurvy by itself is often experienced to make great ravage, where the air has been properly renewed and ventilated, and the whole ship kept clean and sweet. I have been told, that the *Namur's* crew, in their expedition to the *East Indies*, though very healthy at the Cape of *Good Hope*, became scorbutic at the time they arrived at *Fort St David's*, notwithstanding the use of that truly noble

escaped with life. To these losses I must add my own dear brother, who commanded the soldiers on board, several gentlemen of the quarter-deck, and sixty of our stoutest and best sailors. Yet, amidst all this danger, through the providence of God, I escaped untouched, to the surprise of all who knew our circumstances, and the fatigue I underwent, when for most part destitute of all assistance. But I have not seen one instance of this illness having been complicated with the scurvy, or of the scurvy seizing a man recovered from that fever for at least six months afterwards; which was indeed one of the longest intervals we ever enjoyed freedom from it.

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invention,

invention, *Sutton's* machine (*y*). And though Lord *Anson's* ship was kept uncommonly clean and sweet after they left the coast of *Mexico*, yet the progress of their misery was not at all retarded by it. And, what is further pretty remarkable, we know, that the scurvy may be perfectly cured in the impure air of a ship; of which the following is a memorable instance.

His Majesty's ship the *Guernsey* brought in to *Lisbon*, after a cruise off *Cadiz*, 70 of her crew afflicted with this disease. Many of them were far advanced, even in the last stages of it. The plague at this time raging at *Messina*, it was with great difficulty our ships could obtain

(*y*) When accounts were received from that great and experienced officer Admiral *Boscawen*, of the general healthfulness of his squadron at the Cape, it was with great reason ascribed to the benefit derived from these useful pipes; though their preservation from the scurvy in particular seems to have been owing chiefly to their having had a good passage, and touching at different places, where proper refreshments were procured them by their brave and wise commander. Upon their arrival at *Fort St David's*, the surgeon to that hospital acquaints me, that the men of wars crews became as highly scorbutic, as any of the others, whose ships were not provided with the machine.

The case of our annual *Greenland* ships, who are so well fitted, large, and convenient, and carry no more men than are just sufficient to navigate them, puts it beyond all doubt, that confined putrid air, bad provisions and water, have often no share in producing this disease. For confirmation of which, see Mr *Maude's* account of them, part 2. chap. 5.

pratique

pratique in any port: so that it was found impracticable to land them. There was another very troublesome circumstance. For, in order to conceal so great a number of sick from the visit of the officers of health, they were under a necessity of shutting them up for some time together in a close place. For this purpose they were with great difficulty removed into the Captain's store-room; where there is generally worse air than in any other part of the ship. This was performed with imminent danger to many of their lives. Several of them, though moved with extreme caution, fell into the scorbutic *deliquium*; whose preservation was owing to the judgment of their ingenious surgeon, and to the liberality of the Captain, who, upon this occasion, ordered them to be plentifully supplied with his richest cordial wines. But every one of these men recovered on board before they left that place, without being landed. The ship lay strict quarantaine a fortnight. After that they were obliged to be extremely circumspect in allowing even those who were pretty well recovered, to go on shore; as their ill looks might have betrayed their situation to the *Portuguese*. This ship had no ventilators: and it is natural

to suppose there might be some remissness in the article of cleanliness, where there was such a number of sick; who, notwithstanding, all recovered.

The learned writer (z) of the great Lord *Anson's* voyage, after clearly evincing the falsity of many speculations concerning this disease, and justly exploding some opinions which usually pass current about its nature and cause, is pleased modestly to offer a very plausible and ingenious conjecture, well deserving consideration. “ Perhaps a distinct and adequate know-
 “ ledge of the source of this disease may never
 “ be discovered. But, in general, there is no
 “ difficulty in conceiving, that as a continued
 “ supply of fresh air is necessary to all animal
 “ life, and as this air is so particular a fluid,
 “ that without losing its elasticity, or any of
 “ its obvious properties, it may be rendered
 “ unfit for this purpose, by the mixing with
 “ it some very subtile, and otherwise imper-
 “ ceptible effluvia; it may be conceived, I say,
 “ that the steams arising from the ocean may
 “ have a tendency to render the air they are
 “ spread through, less properly adapted to the
 “ support of the life of terrestrial animals,

(z) The Reverend Mr *Walter*.

“ unless

“ unless these steams are corrected by effluvia
“ of another kind, and which perhaps the
“ land alone can supply.”

It must be allowed, that the air, which is a compound of almost all the different bodies we know, has many latent properties, by which animals are variously affected; and these we neither can at present, nor perhaps ever will be able to investigate. We do not even know certainly what this *pabulum vitæ* is in that fluid, which preserves and supports animal life. The only means then we have to judge of the existence of such an occult quality as may be supposed peculiar to the air of the ocean, must be from its effects. These, upon this supposition, ought to be most noxious, and most sensibly perceived, in the middle of the great oceans, and at the widest distance from the continents and islands, where there is the greatest want of land-air, and of its vital influences, which may be presumed so necessary to the support of the life of terrestrial animals. But it is experienced, that ships cruising upon certain coasts, at a very small distance from the shore, where the air consequently differs widely from that of the main ocean, as being impregnated with many particles from the land,
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and is almost the same with that of the sea-port towns, are equally, if not more, afflicted with this disease, than others are in crossing the ocean. And it will be found universally to appear in a much shorter time, and rage with greater violence, (all circumstances being otherwise alike), in a Squadron cruising in the narrow seas of the *Baltic* and *Channel*, or upon the coasts of *Norway* and *Hudson's* bay, than in another continuing the same length of time in the middle of the *Atlantic* ocean. We often observed our *Channel* cruisers quickly over-run with the scurvy; while their consorts, fitted out at the same port, and consequently with the same state of provisions and water, who soon left them, stretching into the main ocean upon a voyage to the *Indies*, or upon a much longer cruise off the *Canaries* or *Cadiz*, kept pretty free from it. For my own part, I never could remark any alteration upon our scorbutic patients, while we continued for many days close in upon the *French* shore, with the wind or air coming from thence, or when, at a greater distance from any land, we kept the middle of the *Channel*: and yet, in either of those stations, difference of weather had a remarkable influence upon scorbutic ailments.

Nay,

Nay, ships and fleets, without going to sea, are often attacked by this malady while in harbour. Thus, when Admiral *Matthews* lay long in *Hieres* bay with his fleet, many of the seamen became highly scorbutic; on which account some hundreds were sent to *Mahon* hospital. And the same has happened to our fleets when at *Spithead*, and even when lying in *Portsmouth* harbour. This disease is not indeed peculiar to the ocean, there being many instances of its raging with equal violence at land (*a*).

FROM what has been said, it appears, that the strong *predisposing causes* to this calamity at sea, are not constant, but casual, upon that element. For though it should be granted, that the sea-air gives always a tendency to the scorbutic *diathesis*, yet the evil proves often highly epidemic and fatal in very short voyages, or upon a very short continuance at sea, to crews of ships who, at other times, have continued out much longer, cruising in the same place, and in parallel circumstances of water and provisions, and yet have kept entirely free

(*a*) Vid. the case of the *German* troops in *Hungary*, and of the *Russian* armies, part 3.

from it. Thus, the great Lord *Anson* cruised for four months, waiting for the *Acapulco* ship, in the *Pacific* ocean; during which time, we are told, his crews continued in perfect health: when, at another time, after leaving the coast of *Mexico*, in less than seven weeks at sea, the scurvy became highly epidemic, notwithstanding plenty of fresh provisions and sweet water on board. And when it raged with such uncommon malignity in passing *Cape Horn*, it destroyed above one half of his crew, in less time than he kept the seas in perfect health, in the before mentioned cruise.

I had an opportunity in two *Channel* cruises, the one of ten weeks, the other of eleven, *ann.* 1746 and 1747, in his Majesty's ship the *Salisbury*, a fourth rate, to see this disease rage with great violence. And here it was remarkable, that though I was on board in several other long *Channel* cruises; one of twelve weeks particularly, from the 10th of *August* to the 28th of *October*; yet we had but one scorbutic patient; nor in any other that I remember, had we the least scorbutic appearance. But in those two I have mentioned, the scurvy began to rage after being a month or six weeks at sea; when the water on board, as I took
particular

particular notice, was uncommonly sweet and good; and the state of provisions such as could afford no suspicion of occasioning so general a sickness, being the same in quality as in former cruises. And though the scorbutic people were, by the generous liberality of that great and humane commander, the Hon. Captain *George Edgcumbe*, daily supplied with fresh provisions, such as mutton-broth and fowls, and even meat from his own table; yet, at the expiration of ten weeks, we brought into *Plymouth* 80 men, out of a complement of 350, more or less afflicted with this disease.

Now, it was observable, that both these cruises were in the months of *April*, *May*, and *June*; when we had, especially in the beginning of them, a continuance of cold, rainy, and thick *Channel* weather, as it is called: whereas in our other cruises, we had generally very fine weather; except in winter, when, during the time I was surgeon, the cruises were but short. Nor could I assign any other reason for the frequency of this disease in these two cruises, and our exemption from it at other times, but the influence of the weather; the circumstances of the men, ship, and provisions, being in all other respects alike. I

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have more than once remarked, that after great rains, or a continuance of close foggy weather, especially after storms with rain, the scorbutic people generally grew worse; but found a mitigation of their symptoms and complaints, upon the weather becoming drier and warmer for a few days. And I am certain it will be allowed, by all who have had an opportunity of making observations on this disease at sea (b), or will attentively consider the situation of

(b) *Extract of a letter from Mr Murray.*

Of the several antecedent or efficient causes of this disease, it is not to be doubted, but a moist air, or hazy, cloudy weather, is among the principal. A particular instance of which happened in a cruise we went upon in the *Canterbury*, along with another ship; after having laid six months in *Louisburg* harbour, where the seamen had great plenty and variety of fish, and where we were properly victualled with sound provisions, and very good bread and water. We cruised not far from the *Bahama Islands*; the weather for most part was stormy, foggy, and very wet. Before we had been at sea a month, the scurvy was very epidemical on board both ships; and in six weeks we had 50, the other (the *Norwich*) 70 patients in this disease: whereas at another time, in different weather, we were at sea nigh as many months, before the like symptoms and diseases appeared, and even then were nothing near so epidemical. The particulars of that cruise were as follow.

We sailed 29th *November* from *Cape Breton*, and in two days were in lat. $43^{\circ} 18'$; and by the 11th *December* were in $29^{\circ} 56'$, near which latitude we kept cruising to the 7th of *January*. During which time the winds were so variable, that it was hard to tell

of seamen there, that *the principal and main predisposing cause* to it, is a manifest and obvious quality of the air, *viz. its moisture.* The effects of this are perceived to be more immediately hurtful and pernicious in certain constitutions; in those who are much weakened by preceeding sickness; in those who, from a lazy inactive disposition, neglect to use proper

tell which point of the compass they inclined most to, or continued longest in. The weather was extremely cold, foggy, and moist, the beginning of the month; but grew gradually warmer as we sunk our latitude. But that its moisture continued, will appear from the following account of rainy days, which you have here, with the other state of the weather. *December.* Rain from the 1st to the 5th; 7th, 11th, 16th, 18th, 21st to 23d; 27th, 29th. Fresh gales 1st, 2d, 3d, 4th, 6th, 7th, 10th, 11th, 14th to 25th; 27th to 31st. Thunder and lightning 3d and 29th.—A fog the 1st.—Most part of the month cloudy and hazy. 174^o/₇, *January.* The weather this month was in general more moderate; but, considering our latitude, not very warm. Rain the 2d, 6th, 10th, 13th, 15th, 16th, 18th, 19th, 24th, 25th, 26th, 31st. Weather cloudy for seven days, but no fogs. Calm the 2d. Fresh breezes 6th, 7th, 9th, 10th, 12th, 16th to 20th; 24th, 25th, 26th, 31st.

The diseases depending upon this weather, were at first, *plethoræ*, from the sudden change from cold to warmth; some acute fevers; and particularly two ardent ones, which carried off the patients. About the end of *December*, people began to complain of the scurvy; and before the middle of *January* we had 16 patients in that disease; and by the 25th, when we arrived at *St Thomas*, we had no less than 50 patients in it; and our consort the *Norwich* 70.

exercise; and in those who indulge a discontented melancholy humour: all which may be reckoned the *secondary disposing causes* to this foul and fatal mischief.

As the atmosphere at sea may always be supposed moister than that of the land; hence there is always a greater disposition to the scorbutic *diathesis* at sea, than in a pure dry land-air. But, supposing the like constitution of air in both places, the inconveniencies which persons suffer in a ship during a damp wet season, are infinitely greater than people who live at land are exposed to; these latter having many ways of guarding against its pernicious effects, by warm dry cloaths, fires, good lodging, &c. whereas the sailors are obliged not only to breathe in this air all day, but sleep in it all night, and frequently in wet bed-cloaths, the ship's hatches being necessarily kept open. And indeed one reason of the frequency of the scurvy in the above cruises, was no doubt the often carrying up the bedding of the ship's company to quarters; where it was sometimes wet quite through, and continued so for many days together, when, for want of fair weather, there was no opportunity of drying it.

No person sensible of the bad effects of sleeping in wet apartments, or in damp bed-cloaths, and almost in the open air, without any thing sufficiently dry or warm to put on, will be surpris'd at the havock the scurvy made in Lord *Anson's* crew in passing *Cape Horn*, if their situation in such uncommon and tempestuous weather be properly considered.

During such furious storms, the spray of the sea rais'd by the violence of the wind, is dispersed over the whole ship; so that the people breathe, as it were, in water for many weeks together. The tumultuous waves incessantly breaking in upon the decks, and wetting those who are upon duty as if they had been ducked in the sea, are also continually sending down great quantities of water below; which makes it the most uncomfortable wet lodging imaginable: and, from the labouring of the ship, it generally leaks down, in many places, directly upon their beds. There being here no fire or sun to dry or exhale the moisture, and the hatches necessarily kept shut, this moist, stagnating, confined air below, becomes most offensive and intolerable. When such weather continues long, attended with sleet and rain, as it generally is, we may easily figure to ourselves the
condition

condition of the poor men; who are obliged to sleep in wet cloaths and damp beds, the decks swimming with water below them; and there to remain only four hours at a time; till they are again called up to fresh fatigue, and hard labour, and again exposed to the washing of the sea, and rains. The long continuance of this weather seldom fails to produce the scurvy at sea.

As to its breaking out so immediately in those ships, upon their leaving the coast of *Mexico* (c), it was not only owing to their finding so few refreshments, especially fruits and vegetables fit to be carried to sea, at the harbour of *Chequetan*; but also to the incessant rains they had in their passage to *Asia*, and the great inconveniencies that necessarily must attend so long a continuance of such weather at sea. To which it may be added, that, by observations made on this disease, it appears, that those who are once infected with it, especially in so deep a degree as that Squadron was, are more subject to it afterwards than others. I remember, that many of them who returned to *England* with Lord *Anson*, and afterwards went to sea in other

(c) Part 3. chap. 2.

ships, were much more liable to the scurvy than others.

It was however remarkable here, that though the calamity began so very soon after their leaving land; yet, in so tedious a passage as four months, it did not rage with that mortality as in passing *Cape Horn*: nor did it acquire so great virulence, as appears by its being so quickly removed upon their landing. And this was owing to the absence of another cause, which is found greatly to inforce and increase the distress, *viz.* cold; the combination of which with moisture is, upon all occasions, experienced to be the most powerful predisposing cause to this malady; though indeed the latter of itself is found sufficient to produce it. And here frequent washing and cleaning of the ship, as was observed, did not stop the progress of the disease; because it did not remove the cause, no more than *Sutton's* machine is found to do; which only renews the air, without correcting its moisture.

Now, any person who has sufficiently considered the situation of a ship's crew, exposed for many weeks to stormy, rainy, or perpetual foggy close weather at sea, will not by this time be surpris'd at our assigning dampness or moisture,

moisture, as a principal cause of the frequency and virulency of this disease upon the watry element. And this is not only agreeable to my own experience, but is confirmed by all just observations that were ever made on this distemper. In the very first just account we ever had of it in *Europe*, from *Olaus Magnus* (*d*), it is remarked, That cold damp lodgings contributed greatly towards its production; that its virulence was always increased by cold and raw exhalations from the wet and damp walls of houses; whereas people living in drier apartments, were not equally subject to it. And accordingly we find, that petty officers, who sleep in close births, as they are called, with canvas hung round, by which they are sheltered from the inclemency of the weather; as also seamen who go well clothed, dry, and clean, though using the same diet with the rest of the crew, are not so soon infected. This is the principal reason why officers obliged to live on the ship's provisions, as the warrant-officers often do, (with this difference, that they drink a greater quantity of brandy and spirits, which, as shall be mentioned afterwards, should in a particular manner dispose them to this disease), by lying

(*d*) Quoted at large, Part 3. chap. 1.

in warm dry cabbins, and going better clothed, are seldom attacked by the scurvy; unless upon its most virulent rage, and when the common sailors have been previously almost destroyed by it.

It is observable, that such a situation as has been described, together with the use of such improper diet as shall hereafter be mentioned, produces the scurvy in any climate: but its virulence will always be greatly augmented by the addition of cold. Thus we find it a much more frequent disease in winter than in summer, and in colder than in warmer climates. Ships that go to the north, as to *Greenland*, and up the *Baltic*, are peculiarly subject to it; whereas it is generally owing, in southern latitudes, to the continual rains which fall there at certain seasons, and more particularly to the great length of these voyages. But a combination of moisture with cold, is the most frequent and genuine source of this disease: and a very intense degree of cold, as in *Greenland*, &c. is experienced to have a most pernicious influence in heightening its malignity.

What effects are produced by these powerful causes on the human body, it is not my pre-

scent purpose to explain (*e*). It may be sufficient here only to observe, that moisture is the parent of corruption or putrefaction in nature; and, by the observation of all physicians from the days of *Hippocrates*, a moist warm air begets the most malignant putrid diseases, even the plague itself. But moisture concurring with other peculiar circumstances, as a gross diet, cold, &c. disposes in a particular manner to the scorbutic corruption.

The qualities of the moist sea-air will certainly be rendered still more noxious, by being confined in a ship without due circulation; as air at all times in this state loses its elasticity, and is found highly prejudicial to the health and life of animals; but becomes much more so where stagnating water is pent up along with it, as it is from thence more speedily disposed to putrefaction. It is likewise heated in ships by passing through the lungs of many people, and impregnated with various putrid effluvia. Hence the eagerness and longings of scorbutic people in such circumstances for the land-air, and the high refreshment to their senses upon being put on shore, are very natural; but no more than what the vapour of fresh earth

(*e*) Vid. chap. 6,

would afford to a person after being long confined in a close, damp, unwholesome air; as that of a prison, dungeon, or damp apartment at land; and what we all feel, upon taking in the fresh country-air, perfumed with the various odours of nature, after having been obliged to breathe in a crowded, dirty, populous city.

I COME, in the next place, to an additional, and extremely powerful cause, observed at sea to occasion this disease, and which concurring with the former, in progress of time, seldom fails to breed it. And this is, the want of fresh vegetables and greens; either, as may be supposed, to counteract the bad effects of their before mentioned situation; or rather, and more truly, to correct the quality of such hard and dry food as they are obliged to make use of. Experience indeed sufficiently shews, that as greens or fresh vegetables, with ripe fruits, are the best remedies for it, so they prove the most effectual preservatives against it. And the difficulty of obtaining them at sea, together with a long continuance in the moist sea-air, are the true causes of its so general and fatal malignity upon that element.

The diet which people are necessarily obliged to live upon while at sea, was before assigned as the *occasional cause of the disease (f)*; as in a particular manner it determines the effects of the before mentioned predisposing causes to the production of it. And there will be no difficulty to conceive the propriety of this distinction, or understand how the most innocent and wholesome food, at times, and in peculiar situations, will with great certainty form a disease. Thus, if a man lives on a very slender diet, and drinks water, in the fens of *Lincolnshire*, he will almost infallibly fall into an ague.

All rules and precepts of diet, as well as the distinction of aliment into wholesome and unwholesome, are to be understood only as relative to the constitution or state of the body. We find a child and a grown person, a valetudinarian and a man in health, require aliment of different kinds; as does even the same person in the heat of summer and in the depth of winter, during a dry or rainy season. Betwixt the tropics, the natives live chiefly on fruits, seeds, and vegetables; whereas northern nations find a flesh and solid diet more suit-

(f) P. 93.

ble to their climate. In like manner it appears, I think, very plainly, that such hard dry food as a ship's provisions, or the sea-diet, is extremely wholesome; and that no better nourishment could be well contrived for labouring people, or any person in perfect health, using proper exercise in a dry pure air; and that, in such circumstances, seamen will live upon it for several years, without any inconvenience. But where the constitution is predisposed to the scorbutic taint, by the causes before assigned, (the effects of which, as shall be shewn in a proper place (*g*), are a weakening of the animal powers of digestion), the influence of such diet in bringing on this disease, sooner or later, according to the state and constitution of the body, becomes extremely visible.

The first, generally, who feel its effects, are those who are recovering from other diseases, or some preceding fit of sickness, by which the whole body, and the digestive faculties, have been greatly weakened; and are in this condition obliged to use the ship's fare. Thus, in *May* 1747, when there prevailed several inflammatory disorders, particularly peri-

(*g*) Chap. 6.

pneumonic fevers, all who were recovering from them became highly scorbutic. The next who complained, were the indolent and lazy: such as are commonly called *sculkers*, and use little or no exercise; a principal help to digestion. As the disease gathered strength, it attacked those who had formerly laboured under it, and had been our patients in *May 1746*; where the constitution had acquired a tendency to it from being formerly deeply infected. It afterwards became more universal; but was confined to the common seamen, particularly to the rawest and newest failors. Imprest men are extremely liable to its attack, by reason of their discontented state of mind; and the marines, by not being accustomed to the sea.

I observed it increased in frequency and virulence, upon the ship's small beer being exhausted, and having brandy served in its place; and this last observation I made in both cruises.

But it will be now proper to inquire into the diet which mariners are necessarily obliged to live upon at sea. And as it appears to be the principal occasional cause of their malady, it may be worth while to consider sea-provisions in their best state; it being found by experience, that, notwithstanding the soundness and
goodness

goodness of both water and provisions, the calamity often rages with great fury, and can be removed only by change of diet. Now, if in this case they appear to have so great an influence in forming the distemper, what ill consequences may not reasonably be expected from a much worse state of them; as from putrid beef, rancid pork, mouldy biscuit and flour, or bad water, which are misfortunes common at sea? all which must infallibly have bad effects in so putrid a disease.

It must be remarked in general, that the sea-diet is extremely gross, viscid, and hard of digestion. It consists of two articles, *viz.* the sweet farinaceous substances unfermented; and salted, or dried flesh and fish.

But more particularly, in our Royal navy, whose provisions, for goodness and plenty, exceed those of any other ships or fleets in the world, every man has an allowance of a pound of biscuit a-day; which, in the manner it is baked, will be found more solid and substantial food, than two pounds of ordinary well-baked bread at land. And this is a principal article of their diet. But the sea-biscuit undergoes little or no fermentation in baking, and is consequently of much harder and more difficult digestion,

gestion, than well-leavened and properly-fermented bread. For it must be here understood, that the meally parts of vegetable feeds dissolved only in water, are by experience found to make too viscid an aliment, to be constantly used by the generality of mankind; whereas, by fermentation, and the acid in the leaven, the glutinous viscosity and tenacious oils of these meally substances are broken and subdued; and they become easily dissolvable afterwards in water, with which before they would only make a paste or glue; and are now miscible with all the humours of the body. Well-baked bread, which has undergone a sufficient degree of fermentation, is of light and easy digestion; and indeed the most proper nourishment for man, as it is adapted by its acescency to correct a flesh-diet: whereas, on the contrary, sea-biscuit, not being thus duly fermented, will in many cases afford too tenacious and viscid chyle, improper for the nourishment of the body, where the vital digestive faculties are weakened and impaired.

The next article in their allowance of what is called *fresh provisions*, is one pound and a half of wheat-flour in the week, which is made into pudding with water, and a cer-
tain

tain proportion of pickled sewet. This last does not keep long at sea, so that they have often raisins or currants in its place. But flour and water boiled thus together, form a tenacious glutinous paste; requiring the utmost strength and integrity of the powers of digestion, to subdue and assimilate it into nourishment. We find, that weak, inactive, valetudinary people, cannot long bear such food.

There remain two other articles of fresh provisions, of which the allowance to each man is more than they generally can use. The first is, ground oats, boiled to a consistence with water, commonly called *burgow*. Of this the *English* sailors eat but little; though in their circumstances it would seem to be wholesome enough, as being the most acescent part of their diet. The other is boiled peas; which are of a mild and softening quality; but having hardly any aromatic parts, they are apt in weak stomachs to breed flatulencies, and occasion indigestion; and, like all other farinaceous substances, give a *lentor* or viscosity to water in which they are boiled. It is evident, that in some cases they must afford gross and improper nourishment.

This is the allowance of fresh provisions;

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and

and they have, besides, a proper quantity given them of salt butter and cheese. The latter of which is experienced to differ extremely in its qualities, or in the ease or difficulty with which it is digested, according to its strength, age &c. But the *Suffolk* cheese will in many instances, instead of assisting digestion, which other cheese is said to do, prove a load to the stomach itself; as well as the salt butter, or sweet oil, given sometimes in its place: neither of which indeed correct the qualities of the other food.

Lastly, Of flesh each man has for allowance two pounds of salt beef, and two pounds of salt pork, *per* week. But these are found by every one's experience to be much harder and more difficult to digest, than fresh meats and, after all, to afford a much more improper chyle and nourishment. No person can long bear a diet of such salt flesh-meats unless it is corrected by bread, vinegar, or vegetables.

To the above articles, which are the provisions with which our navy is usually supplied may be added, stock fish, salt fish, dried or jerked beef, often eat at sea; with whatever is of the like gross, viscid, and indigestible nature: all which

which will have still more noxious qualities when unbound, or in a corrupted state.

For drink, the government allows, where it can be procured, good sound small beer; at other times wine, brandy, rum, or arrack, according to the produce of the country where ships are stationed. Beer and fermented liquors of any sort will be found the best antiscorbutics, and most proper to correct the ill effects of their sea-diet and situation; whereas distilled spirits have a most pernicious influence on this disease.

As I shall have occasion elsewhere (*b*) to shew the natural consequences of such diet, it will be sufficient here to observe, that though the long continuance and constant use of any one particular sort of food, without variety, has its inconveniencies, and is justly condemned by physicians (*i*), nature having supplied us with an ample variety, designed no doubt for our use; yet the fact here truly is, that such food as has been mentioned, is at particular times, and in certain circumstances, not properly adapted to the state of the body, and the condition of the digestive powers (*k*).

Our

(*b*) Chap. 6. on the theory of the disease.

(*i*) *Vid. Celsum de medicina.*

(*k*) A learned Professor was pleased to send me the following queries.

Q 2

“ May

Our appetites, if they are not depraved, are, upon this and many other occasions, the most faithful monitors, and point out the quality of such food as is suited to our digestive organs, and

“ May not the scurvy be owing to such a cause as other epide-
 “ demical diseases ; that is, something in the air which we do
 “ not know, nor will probably ever know, though we see its
 “ various effects in fevers, small pox, measles, plague, &c. ?
 “ And may not this be a modern *miasma*, as well as what pro-
 “ duces some of these diseases ? By observations the *causæ pro-*
 “ *egumentæ* may be discovered, and by dissections the effects
 “ may be observed ; but the *causa proxima* may yet be unknown.
 “ In the plains of *Stirlingshire* the people live mostly on crude
 “ pease-meal, have very bad water, and have great fogs from
 “ their own grounds, and from the Frith ; yet, among the nume-
 “ rous poor patients I have from that place when in the coun-
 “ try, I have not seen one with a genuine scurvy.”

Answer. As to its being a *modern miasma*, I think this cannot, with any colour of reason, be inferred from the silence of ancient historians, who have mentioned few or no camp-diseases ; nor on account of its being imperfectly, if at all, described by ancient physicians, for reasons assigned part 3. chap. 1. The first description of it I have met with, and a very accurate one, is in the year 1260 (vid. part 3. chap. 1.). There is no account of it again until after *ann.* 1490. Yet we cannot well suppose, that during that period there was no such disease in the world, or that people in such situations as are now to be mentioned, would not contract the scurvy.

It is demonstrable from the appearance of the calamity in every part of the world, that no state of air whatever is capable of producing it, without the concurrence of gross, viscid diet, and abstinence from green vegetables. I have known the *Channel* fleet bury a hundred men in a cruise, and land a thousand
 more

and to the state and condition of the body. For where there is a disposition to the scorbutic corruption from a long continuance in the moist sea-air, concurring with the viscous, glutinous, and

more quite rotten in the scurvy; yet, among the number, there was not an officer, not even a petty officer.

In *Hungary*, where there must have been the strongest scorbutic disposition in the air (Vid. *Kramer*), not only the officers, and natives of the country, but even the dragoons, by having more pay, and consequently better diet, cloathing, and lodging, though equally subject to the other diseases of the country, yet kept free from the scurvy. Who were attacked by it? Only the *Bohemians*, who eat the coarsest and most gross food. The *Bohemians* used no other than what was the ordinary diet of their own country, as we are informed by *Kramer*. The seamen in the *Channel* cruisers had the very same provisions as other ships who went upon different stations: yet it is evident one cause in both places was the diet; as a different diet prevented the disease, and change of diet quickly cured it.

Now, there must have been a quality in the air of *Hungary* different from that of *Bohemia*; something which rendered a diet harmless in the one country, hurtful in the other. The indisposition of the air in *Hungary* was very obvious. The disease prevailed only in the spring, and during a wet season; was much more virulent in some parts of the country than in others. *Kramer* enumerates the different places where it raged most, *viz.* where-ever the soil was damp and marshy. This observation has been made not only in *Hungary*, but in every other part of the world; and I will venture to affirm, that, without any one exception,

Scorbutus locis aridis ignotus est.

STEGGIUS.

Moisture was discovered to be one of the causes of this malady by *Rossseus*, the very first author who ever wrote expressly upon it.

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and too solid diet used there, nature points out the remedy. In such a situation, the ignorant sailor, and the learned physician, with equally long, with the most craving anxiety, for a green

The facts he produces, seem demonstratively to prove it; besides having the corroborating evidence of every accurate observation made since his time. All which, *viz.* the experience of two hundred years, we must contradict, by excluding this cause, and referring the scurvy to occult *miasmata*, or such latent causes in the air as produce fevers, and some other epidemical diseases. There are indeed perhaps but few diseases whose causes are more evident to the senses, and admit of more express proof. *Stugart*, in *Germany*, was formerly noted for being a place where the scurvy raged much; but, upon drying up a large lake in the neighbourhood of the town, the disease has since quite disappeared. Along the banks of the *Rhine*, from *Doullach* to *Mentz*, particularly at *Philipsburg*, it often succeeds large inundations of that river. *Sinopæus* observed at *Cronstadt*, that the appearance of the scurvy, and its malignity, always depended upon the wetness of the season; a dry season instantly stopt it.

Where we have such undeniable proofs of the effects of moisture and driness, I cannot see any reason for having recourse to occult *miasmata* in the air, or the like imaginary and uncertain agents, for breeding a disease which a person contracts from moist air, by lying in a damp lodging, and using at the same season too solid gross food. Such circumstances produce the distemper in every part of the world: and it may effectually be prevented at any time, by living in dry apartments, going well clothed, and having proper diet.

Though I have called the one *the predisposing*, the other *the occasional cause* of the malady; yet, to speak more properly, they are both of them (*viz. diet and moisture*) *causæ proeguminæ*, predisposing causes to the disease. They are each but half

green vegetables, and the fresh fruits of the earth; from whose healing, attenuating, and saponaceous virtues, relief only can be had. And such people, in the height of the malady,
not

half-causes, neither of them singly being able to produce it: but both of them concurring, constitute the *causa proxima*; *i. e.* all that is requisite and sufficient to form the scurvy.

As to the case of the people in *Stirlingshire*; have they no onions, coleworts, &c.? A mess of broth twice a-week, such as is made by the poorest people in *Scotland*, of green coleworts, barley, and oats, would have preserved Lord *Anson's* Squadron from the scurvy in passing *Cape Horn*. It is to be remembered, that these causes must not only conjunctly subsist, and exert their influences together in a high degree; but must act likewise a considerable time without intermission, especially the diet. Change of food has not only a most surprising effect to recover from a very deplorable state in the scurvy, but even the smallest alteration of diet has a wonderful influence in preventing the approach of it. This is evident from what is said (chap. 5.) of the present healthfulness of our factories at *Hudson's bay*; where scorbutic *miasmata* (if any such there be) are not wanting in the air, even at this day; as is plain by the late afflicted condition of *Ellis's* people (see part 3.), whilst the persons in those factories were quite healthy. It is farther confirmed by a fact which has more than once occurred. In our fleet, when in conjunction with *Dutch* ships, many of our men have become scorbutic; mean while the *Dutch* were quite free from it; which was owing to a mess of pickled cabbage given them now and then.

And, for the same reason, *viz.* a very small difference in the way of living or diet, even the frequent baths of the ancients, might have preserved their troops from the scurvy when quartered in *Pannonia*, the woody, marshy parts of *Gaul*, *Germany*, and the *Low Countries*; as is evident from the late case of the Imperial dragoons.

What

not only employ their thoughts all day long on satisfying this importunate demand of nature, but are apt to have their deluded fancies tantalised in sleep with the agreeable ideas of feasting upon them at land. What nature, from an inward feeling, makes them thus strongly desire, constant experience confirms to be the most certain prevention and best cure of their disease.

MOREOVER, the same causes when subsisting at land, have been experienced at times to give rise to as virulent and epidemic scurvies as at sea. Thus, during the siege of *Thorn* in the year 1703, several thousand *Saxons* shut up in that city were cut off by it. But at the latter end of the siege, they being blockaded for five months, the season appears to have been uncommonly tempestuous and rainy, over most parts of *Europe*: so that, in this situation, the inconveniencies and hardships they suffered, must have been equal to those of seamen. They were continually exposed to unwholesome damp weather; their diet was gross and viscid,

What I have here said, is not with design to exclude the bad effects of some other causes upon this distemper. But to breed a disease, and to give vigour to it when bred, are very different things.

viz.

viz. ammunition-bread, salt and dried meats, and other solid and coarse food; which they were at that time obliged to live upon, being deprived of vegetables. We are told (1), that when some few of the most common and coarsest greens were permitted to be brought into the town, by agreement entered into with the enemy, they were voraciously devoured by the officers at the gates, as the greatest delicacies. The inhabitants, indeed, ascribed the calamity to the unwholesome beer in the city. But it was observable, it attacked and cut off first the *Saxon* garrison; who were most exposed to the inclemency of such weather, by doing hard duty night and day upon the walls. The inhabitants, who remained in warmer lodgings, were much later infected with it; and probably only those, who, upon the garrison's being almost destroyed, were obliged to do duty. This was a real scurvy; as no sooner the gates were opened, and plenty of vegetables admitted upon the surrender of the town, but the disease quickly disappeared, after having occasioned a very dreadful mortality.

2. THE next thing to be considered, is the

(1) *Observationes circa scorbutum, &c. auctore Fred. Bachstrom.*

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peculiar

peculiar situation and circumstances of such places and countries where it is found to be a constant or endemic disease; which will serve further to illustrate and confirm what has been advanced.

It is observed, that an intense degree of cold, such as the inhabitants suffer during the hard winters in *Iceland*, *Groenland*, the northern parts of *Russia*, &c. together with the diet they are necessarily obliged to use during that rigorous season, infallibly gives rise to this disorder. And here we cannot but remark the pernicious effects of cold in augmenting its malignity, and rendering it a much more frequent and virulent distemper in these northern countries, than in warmer climates. It may however be doubted, whether the most intense degree of cold, provided the air is dry and pure at the same time, would breed this malady. For all these northern countries are subject to great fogs, not only in summer, but in winter, and when the cold is excessive, are pestered with what is called *frost-smoak*; a vapour which rises out of the sea like smoak from a chimney, and is as thick as the thickest mist (*m*).

(*m*) Vid. *John Edge's* account of *Greenland*, a *Danish* missionary, who resided there fifteen years.

Moreover,

Moreover, it is very certain, that the frequency of this evil in other places, as in the *Low Countries*, where it was formerly greatly endemic, and whose authors have furnished us with the most accurate observations, was not owing to their cold and northern situation only; for in that case, all people living in the same degree of cold, would, *cæteris paribus*, have been equally affected: whereas, in the very same climate of *Holland*, there were many villages and cities, living on a like diet with their neighbours, who kept entirely free; while others, at no great distance from them, were extremely subject to it.

Thus, *Ronssjeus* (*n*) takes notice, that in his time it was a much more frequent malady at *Amsterdam* and *Alcmaer*, than at *Goude* and *Rotterdam*; and at *Dort*, though in the same climate, and where the inhabitants eat the same food, it was hardly ever to be seen: but that, uniyersally, in all parts of the country where the soil was fenny, damp, and marshy, it raged with the greatest violence. This very accurate author observes likewise, the great influence which the weather had upon it; as, that

(*n*) *Ronssjeus de magnis Hippocratis lienibus, &c. seu vulgo dicto scorbuto.*

a long continuance of southerly and westerly winds (*o*) always occasioned a great frequency of this distrefs; but that rainy seasons especially, rendered the mischief quite epidemic and malignant. When this physician wrote, his country was little better than a large morafs, exposed to frequent inundations from floods and high tides; which, together with the gross coarse diet used by the *Dutch* at that time, made the scurvy perhaps the most frequent endemic of their country. But now they are become a rich flourishing republic, and have dried and improved their soil by dikes and drains, and also quite altered their way of living, the disease appears but seldom; and is to be seen chiefly among the poorer sort, who inhabit the low damp parts of the provinces, and continue in their old gross way of living (*p*), upon salt, smoked, often rancid pork, coarse bread; and are necessitated to drink unwholsome stagnating waters. They have indeed at times been subjected to violent returns of their old distemper; as in several of their wars, when obliged to overflow their country with water.

(*o*) These are observed by *Muffchenbroek*, to be the moistest winds that blow in *Holland*. *Vid. Element. philosophiæ naturalis.*

(*p*) *Vid. Brunneri tractat. de scorbuto.*

The case is the same in many other countries at present, *viz.* the *Lower Saxony*, and other parts of *Germany*, *Sweden*, *Denmark*, and *Norway*; where, in general, the disease is much less frequent than it was formerly; the face of all these countries, and the manner of their living, being much improved within these last 200 years. They now drink wine more freely, brew better ale, live in drier, and more airy commodious houses, and have greatly drained and improved their lands.

But here it may be worth while to remark, that in all those parts where the scurvy was formerly so peculiarly endemic, by reason of their marshy and damp situation, together with their gross unwholesome diet, the cold of the climate must certainly have contributed a great deal towards its production. For we observe, that at *Venice*, whose situation is as damp as most places, the disease is unknown. This seems owing principally to the heat of their climate, which raises the watry vapours to a great height above the surface of the earth, and there disperses them; giving the inhabitants almost constantly serene fine weather: unless it should be rather supposed, that their light and wholesome diet, and the great quantity of vegetables

eat

eat by the *Italians*, are sufficient, in the moister parts of their country, to preserve them from this evil.

I SHALL now, in the third and last place conclude with observing the effects of the different causes assigned, in countries where they prevail less frequently; and shall restrict my observations to *Great Britain*.

In cold sea-port towns, where the situation of the place is bleak, low, and damp, we generally observe the inhabitants afflicted with putrid gums, œdematous swelled legs with ulcers, &c.; whilst the neighbouring villages, situated in a sandy dry soil, and purer air, are entirely free from all scorbutic appearances. In places where they have continual rains, and much moisture, the scurvy is endemic; as at *Fort-William* (q).

They who live in swampy inland soils, near morasses, or incompassed with thick woods and forests; or in countries subject to inundations from lakes or rivers; or where there are corrupted stagnating waters, where the sun has not sufficient influence to elevate their va-

(q) Vid. Dr *Grainger's* account of it while there in the year 175 $\frac{1}{2}$, chap. 2.

pours to a proper height above the earth, being continually surrounded with unwholsome fogs and mists, are subject both to scurvies and agues. Those who live in the higher apartments of a house, are observed to be less liable to these disorders, than others who live on the ground-floors of the same house. The poorer sort of people, who live in damp vaults and cellars under ground, are most afflicted with symptoms truly scorbutic; as are likewise they who are confined in dungeons, damp and unwholsome prisons, and spend much of their time sleeping in apartments not sufficiently plaistered or wainscotted, where there is a continual moisture and dewy dampness on the stone-walls: an instance of which I saw lately, in a person confined in a jail, who became highly scorbutic (*r*).

Different aliments are found by experience to produce the most different effects upon this disease. We see it most common among the poorer sort of people in the before mentioned situations, who feed much on dried or salt fish and flesh, and the unfermented farines, without using green vegetables and fruits (*s*); or upon bread made of peas, or a composition of these

(*r*) Vid. chap. 2. (*s*) Vid. two cases in *Fife*, chap. 2. & 5.
with

with oats; and, during the winter, eat what is called *broose*, which is oat-meal mixed with the fat of salt beef; and, for want of fresh and wholesome water, use what is either hard and brackish, or putrid and stagnating.

Different ways of life have likewise a different influence on this disease. The lazy and indolent, and those of a sedentary life, as shoemakers, tailors, especially weavers, by reason of their working in damp places, are most subject to it; while hard labourers, and those who use much exercise, though living on the same or even grosser food, keep entirely free. Fishermen, from their way of life, gross food, and habitual use of spirituous liquors, are often scorbutic.

The passions of the mind are experienced here to have a great effect. Those that are of a chearful and contented disposition, are less liable to it, than others of a discontented and melancholy mind.

Lastly, It has always been remarked, that in such circumstances as have been described the present state of the body has a powerful influence in disposing to this affliction. They who are much exhausted and weakened by preceeding fevers, and other tedious fits of sickness

ness, or they who have unsound and obstructed *viscera* (as after agues of the autumnal kind), are apt, by the use of improper diet, to become scorbutic. Others that labour under suppression of any natural and necessary evacuation, as women who have their *menfes* suppressed, especially if the obstruction is occasioned by fear or grief, are more subject than others in similar circumstances to this disease; as they are likewise at the time that these naturally leave them.

THE following abstract from the ingenious Mr *Ives's* journal, containing a history of diseases that occurred on board the *Dragon*, serves to confirm many things which have been advanced.

1743. *July*. We have been free from the scurvy ever since the latter end of *April*. Lay all this month at *Mabon*, where the weather was excessively hot. Our men wrought hard, and drank much wine and spirits. The disorders of the foregoing month increased, with greater inflammation. These were fevers with inflamed tonsils, pleurisies, and peripneumonies. Sent 17 men to hospital.

August. Continued at *Mabon*. The people received some prize-money, which did not better their health. The same diseases prevailed as in *July*, but
S proved

proved fatal to none. Towards the end of the month fluxes took place of fevers. Sent 18 to hospital.

September. Part of this month at *Mahon*, part at sea. The weather in the beginning was variable with rains; towards the latter end moderate and hot. The disease peculiar to it was the dysentery: it continued with the patient for most part 5 or 6 weeks, but proved fatal to none. We had also some slight fevers, rheumatifms, and agues.

October. Mostly at sea. The weather pretty moderate, though changeable. Rain and wind the 17th and 18th of the month. My sick-list was made up chiefly of men recovering from the fluxes of last month. The disorder peculiar to this was the rheumatism; which however did not prove obstinate. We had also 2 or 3 quartan agues, which continued for several months.

November. Partly at sea, partly at *Gibraltar*. From the 1st to the 10th fresh easterly winds blew often with rain. The whole month was squally, but dry towards the latter end. On the 8th day, 6 or 8 people were taken with pains in their head, shiverings, and sometimes a vomiting. The next day they were feverish. On the 3d or 4th they complained of an universal prickling under the skin, and had a short uneasy cough. On the 5th or 6th they were covered with little red spots like flea-bites, with sore and watery eyes. On the 8th they either sweated plentifully, or had a looseness; and then they were sure to do well soon; though some spit, and others were relieved

ed by urine. 20 seized with this species of measles, all recovered. Rheumatisms still continue.

December. Lay at *Gibraltar*. It was in general a cold, wet, stormy month. The sick-list contained various, but not material complaints. Towards the latter end of it we had appearances of an approaching scurvy, although at *Gibraltar* (*t*). Sent 22 to hospital.

1744. *January.* It was an extreme cold and stormy month, with almost constant rain. On the 8th *a. m.* we had a violent gale, with thick weather. The storm continued the 9th, with much rain *a. m.* From the 13th to the 27th the season was uncommonly tempestuous, with rain.

On the 8th day we left *Gibraltar*, growing daily worse in the scurvy. On the 10th day 50 scorbutic patients were on the sick-list, and by the 20th they were increased to 80. Many of them were now extremely bad, with hard contracted limbs, ulcerated legs, rotten gums, stinking breath, offensive stools, shortness of breath, &c.

On the 30th of *January* my list stood thus. Very bad in the scurvy 55. Scorbutic fluxes 6. Scurvy with cough 10. Scurvy with ulcers 10. Scorbutic asthma 1. Scorbutic hæmoptoe 1. Scorbutic hæmorrhoids 1. Other disorders not scorbutic, chiefly colds, 6. Sick in all 90. The ship at sea till towards the latter end of the month she arrived in *Hieres* bay.

(*t*) Not for want of the vital influences of land-air, as ships here lie closely embayed.

February was a cold, stormy, and rainy month. The weather, especially in the beginning and latter end of it, was extremely rough and uncomfortable.

From the 3d of this month to the 10th, the sick were on the ordinary days on which they are allowed salt beef and pork, served with fresh meat, and broth with greens in it; in all about 5 times.

Upon coming into the bay of *Hieres*, our men understood the enemy's fleets and ours were very soon to engage. There appeared not only in the healthy but also in the sick, the highest marks of satisfaction and pleasure: and these last mended surprisingly daily; infomuch that on the 11th of *February*, the day we engaged the combined fleets of *France* and *Spain* we had not above 4 or 5 but what were at their fighting-quarters. From the 11th to the 15th few or none took notice of their illness. On the 15th my list stood thus. Recovering from the scurvy 30. Scorbutic complaints in the first stage 5. Bad in the scurvy 4. Ulcers 4. Pleurisy 1. Flux 1. *Lumbagines* 3. Agues 2. Coughs and cold 11. Sick in all 61 (*u*).

N. B. No person has been sent on shore for cure.

(*u*) A surprisng instance of the influence of the passions of the mind on this disease! For I think no person can ascribe the alteration of the sick-list from 30th *January* to 15th *February* to five servings or messes of broth. May not the relapses afterwards have been much occasioned by the unfortunate engagement on the 11th *February*? The *Dragon* however that day did her duty.

since *December*; and I do not find that above 1 has died. When we got to *Mabon* the latter end of the month, my sick-list was greatly increased; those who were so much mended before, having relapsed. I here put all the sick to hospital.

March. It was in general a cold, windy, and rainy month. When it did not rain, it was commonly cloudy and hazy. In the latter part of it the wind was more moderate: but on the last day of the month we had a strong gale, though without rain. We spent all this month at *Mabon*; where we now and then had a fresh patient in the scurvy, whom I always put on shore. 5 or 6 scorbutic men who had coughs, are now in deep consumptions. Towards the latter end of the month coughs and slight fevers prevailed.

April. On the 1st and 2d day the weather was stormy. From the 3d to the 7th squally, with rain. From the 8th to the 12th moderate and fair. From the 12th to the 20th fresh gales, with rain. From 20th to 26th calm and fair. From thence to the end of the month close rainy weather, but warm. We were this month at sea on the coasts of *France*, *Savoy*, and *Genoa*. In the beginning of the month the coughs and colds increased; and towards the middle and latter end of it, they were attended with inflammation and danger. 4 or 5 had peripneumonic symptoms, 1 of whom died. 3 or 4 had high fevers with delirium, &c. 1 of whom died also. In the latter end of the month we had 2 troublesome ophthalmias.

May. The weather was very warm; sometimes fair,
at

at other times hazy and rainy. We spent this month at sea as in the last, and on our passage to *Mahon*.

The disorders differed little from those in *April* though not fatal to any. I should have mentioned that in the latter end of last month 2 or 3, who in other respects were perfectly healthy, complained of an universal cutaneous itchy eruption. More were seized with it this month, and it proved very troublesome. One of them caught cold, fell into a fever and had near died; but at last was saved by nature throwing out a second time the peccant matter on the skin.

June. Although we were at *Mahon*, where the weather was very hot, and our men worked hard yet our inflammatory complaints did not increase, but rather lessened. Towards the middle, and in the end of the month, a gentle diarrhæa prevailed throughout the ship's company.

Left *Mahon* the 14th *June*, and arrived at *Gibraltar* the 30th.

July. The weather was excessive warm, and for most part clear and dry. On the 3d we left *Gibraltar*, and on the 19th or 20th arrived at *Lisbon*.

A few have still gentle diarrhæas; but, in general, a very healthy month.

August. The weather was for most part hot and dry, except the 21st day, which was squally, with heavy rains. We lay all this month at *Lisbon*, where the men were served with fresh provisions and greens twice a-week from the city. They had here the

finest

best opportunity of being provided with all manner of vegetables. We continued still healthy, with now and then a slight diarrhæa.

September. From the 1st to the 4th we had high winds; but from the 5th to the 14th the wind was very moderate. All this first part of the month the weather was cloudy, hazy, and rainy, with a good deal of lightning. From the 15th to the end of the month the winds were moderate, and weather very changeable, being for most part cloudy and rainy, with some intermediate days fair, and generally warm. We left *Lisbon* the 3d; got to *Gibraltar* the 15th.

Though a healthy month, yet, towards the middle and latter end of it, we had now and then a scorbutic complaint. Sent 9 to hospital, for different ailments.

October. Except a few days of good weather and gales, it was a very windy, rainy, and foggy month; sometimes hot, at other times cold.

We were much alarmed at the sudden appearance of the scurvy (x). On the 13th I put on shore 24 people. We left *Gibraltar* the 14th; and when we came the length of *Minorca*, having received orders to proceed further, I sent 20 men in the scurvy also, by the *Portsmouth* storeship, to *Mahon* hospital.

November. From the 1st to the 11th, we had cold air weather, with variable winds. The remaining

(x) Not owing to abstinence for so very short a time from vegetables. Their late supply at *Lisbon* was a thing uncommon to them.

part of the month was remarkably bad, with high piercing, cold winds, much rain, and some snow.

We arrived at *Vado* the 20th, and sailed from thence the 29th. Upon our arrival there we had 50 men in the scurvy (y).

December was also a very cold, windy, and we month; with but few intermissions of little wind, and fair weather.

1745. *January* was much the same as the former month. We had but 8 days in it that were moderate and fair.

When we arrived at *Vado*, as before mentioned, on the 20th of *November*, I gave to every scorbutic patient one *China* orange, and three apples; and continued to do so daily till the 5th of *December*, when the apples being all gone, they had only the continuance of an orange, which lasted to the 7th of *December*. On the 22d *November* they had fresh flesh broth. On the 27th they had the same with turnip boiled in it; and again on the 29th *November*, 1st and 2d *December*; which was the whole supply of fresh meat and vegetables we got at *Vado*. On the 8th of *December*, being then off *Sardinia*, Captain *Watson* now Rear-Admiral of the Blue, agreeable to his wonted humanity, gave mutton-broth to 21 of our men; the 13th he did the same to 45. Now follow the remarks in my diary.

[*November* 29. The scorbutic people in general

(y) Putrid air could have but little influence during so cold a season.

men

mend much. Those whose limbs were contracted, grow pliable; their rotten gums become sounder; shortness of breath, &c. better (z).

December 2. They continue to mend much.

December 5. The weather not so cold since we left *Mado*.

December 6. All are recovering from the scurvy.

December 25. My sick-list contained but 30; and these almost well, and recovered from the scurvy.

January 6. We are still at sea; the weather cold and wet; and for 9 days past have been in want of fire for the people. The scorbutic patients are refreshed, and more are added to the sick-list, being unfit for duty.

January 8. Anchored at *Makon*; put to hospital [in the scurvy.]

February. A cold uncomfortable month, which we spent at *Makon*; where we had now and then a case of the scurvy; but more towards the end of it, with venereal symptoms. Sent 5 to hospital.

March. The weather this month was warmer, but constant. The winds moderate. Left *Makon* the 10th; arrived at *Gibraltar* the 22d. The list was pretty numerous, composed of valetudinarians taken from *Makon* hospital, and one or two fevers. Put to hospital at *Gibraltar* 14.

April. The one half of this month was fair, the other half rainy, cloudy, and foggy; but generally warm.

(z) This Mr *Ives* justly ascribes to the oranges and apples.

T

We

We had some, though not many, ill of coughs and colds. One old man died of a fever. Left *Gibraltar* the 6th, carrying along with us all our people from the hospital, where they were badly supplied with vegetables and fresh meat. We were in hopes of doing better for them at *Lisbon*, or on the coast of *Portugal*; where we continued cruising all this month

May. The weather was moderate and warm, without much rain, though sometimes hazy. Spent the month at sea.

In the middle and latter end of it, several were of scurvies, others of fluxes. We got no refreshment from the land for the poor people brought from hospital. And the sick must have suffered much, had not Captain *Watson* supplied them. He caused some of his sheep to be killed for their use; and gave us entirely (as indeed was his wonted custom under such distress) every drop of milk his cow afforded, for their benefit.

June. Boisterous winds blew continually from the north, which occasioned very uncomfortable weather at sea; and kept the air pretty cool, until the 13th, when we arrived at *Lisbon*, very ill in the scurvy (*a*). He 3 or 4 died of it.

July. We continued at *Lisbon*. All have not yet got free of their scorbutic ailments; several have scorbutic fluxes; others have diarrhæas and dysenteries.

(*a*) This weather must have proved very hard upon the weakly men taken from *Gibraltar* hospital.

without any symptom of the scurvy. Towards the latter end of the month, several were in fevers.

August. Slight fevers, but especially diarrhæas and dysenteries, still prevail. Mr *Mauberty* our carpenter died of the dysentery. I called to his assistance Dr *Kennedy* physician at *Lisbon*, and Dr *Lind*, then surgeon of the *Kennington*. 22d of this month we left *Lisbon*, and sailed for *England*. Had then 20 sick on my list.

C H A P. II.

The diagnostics, or signs.

IN order to observe greater accuracy in the description of a disease attended with so many and various symptoms, these might have been properly enough ranged under three classes.

The *first*, Containing the most common and constant symptoms; such as may be said to be essential to the nature of the malady.

The *second*, Such as are more casual and accidental; proceeding not so much from the genius of the distemper, as from the epidemical constitution of the air, the state or habit of the body at the time, or from the determination of other causes.

And the *third*, Some extraordinary and uncommon symptoms, that sometimes, though but seldom, have happened in it; and which occur only in the highest and most virulent state of this disease, from the peculiar *idiosyncrasy* of the patient, its combination with other malignant diseases, or from other incidental circumstances.

But, for the sake of greater perspicuity, chuse rather to describe the symptoms in the order in which they generally appear, and peculiar to the several stages of the disease, and shall distinguish, as I go along, those which are more constant or essential, from the less frequent or adventitious.

The first indication of the approach of this disease, is generally a change of colour in the face, from the natural and usual look to a pale and bloated complexion; with a listlessness to action, or an aversion to any sort of exercise. When we examine narrowly the lips or the caruncles of the eye, where the blood vessels lie most exposed, they appear of a greenish cast. Mean while, the person eats and drinks heartily, and seems in perfect health, except that his countenance and lazy inactive disposition, portend a future scurvy.

Th

This change of colour in the face, although it does not always precede the other symptoms, yet constantly attends them when advanced. Scorbutic people for the most part appear at first of a pale or yellowish hue, which becomes afterwards more darkish or livid (*a*).

Their former aversion to motion degenerates soon into an universal lassitude, with a stiffness and feebleness of their knees upon using exercise; with which they are apt to be much fatigued, and upon that occasion subject to a breathlessness or panting. And this lassitude, with a breathlessness upon motion, are observed to be among the most constant concomitants of the distemper.

Their gums soon after become itchy, swell, and are apt to bleed upon the gentlest friction. Their breath is then offensive; and upon looking into their mouth, the gums appear of an unusual livid redness, are soft and spongy, and become afterwards extremely putrid and fungous; the pathognomonic sign of the disease.

(*a*) *Mr Murray's remark.*—They commonly appear of a melancholy and sullen countenance; such also is their disposition of mind. So that dejection of spirits may justly be reckoned a cause as well as symptom of the future malady.

They

They are subject not only to a bleeding from the gums, but prone to fall into hæmorrhages from other parts of the body.

Their skin at this time feels dry, as it does through the whole course of the malady (*b*). In many, especially if feverish, it is extremely rough; in some it has an aserine appearance; but most frequently it is smooth and shining. And, when examined, it is found covered with several reddish, bluish, or rather black and livid spots, equal with the surface of the skin, resembling an extravasation under it, as it were from a bruise (*c*). These spots are of different sizes, from the bigness of a lentil to that of a handbreadth, and larger. But the last are more uncommon in the beginning of the distemper; they being usually then but small, and of an irregular roundish figure. They are to be seen chiefly on the legs and thighs; often on the arms, breast, and trunk of the body; but more rarely on the head and face.

(*b*) *Mr Murray*.—Except in the last stage, when a cold clammy moisture may be often observed on the skin, especially if the patient is subject to faintings.

(*c*) *Mr Murray*.—The skin begins to look in spots with a yellow rim. From thence the deepness of the dye gradually increases, till it becomes of a deep purple, and sometimes quite black.

Many

Many have a swelling of their legs; which is first observed on their ankles towards the evening, and hardly to be seen next morning: but, after continuing a short time in this manner, it gradually advances up the leg, and the whole member becomes œdematous; with this difference only in some, that it does not so easily yield to the finger, and preserves the impression of it longer afterwards than a true œdema.

These are the most constant and essential symptoms of this malady in the progress of its first stage. But a diversity is sometimes observed in the order of their appearance. Thus, when a person has had a preceding fever, or a tedious fit of sickness, by which he has been much exhausted, the gums for the most part are first affected, and a lassitude constantly attends; whereas, when one has been confined from exercise by having a fractured bone, or from a bruise or hurt, these weak and debilitated parts become almost always first scorbutic (*d*).

As

(*d*) *Mr Ives.*—As was the case of *John Thomas* marine, belonging to the *Dragon*, who, on the 18th of *August* 1742, got, by a musket-ball from the *Spaniards*, a very bad fracture of the *os humeri*, with great comminution. Eight or ten large pieces of the bone were cut in upon, and taken away, and the bones shivered

As for example, if a patient labours under a strain of the ankle, the leg, by becoming swelled, painful, and œdematous, and soon after covered with livid spots, gives the first indication of the disease. And as old ulcers on the shin are very frequent among seamen, in this case likewise the legs are always first affected, and these ulcers put on the scorbutic appearance, although the patient seems otherwise perfectly healthy, and preserves a fresh good colour in his face.

The distinguishing characteristics of scorbutic ulcers are as follow. They afford no good digestion, but a thin, foetid, sanious stuff, mixed with blood; which at length has the true appearance of coagulated gore lying caked on the surface of the ulcer, and is with great

shivered quite to its head. By the end of *November* following, a union was brought about by means of an interveening *callus*, and a sound skin brought over almost all the incisions. He had nearly recovered his flesh and strength lost under the discharge and confinement, being daily supplied with fresh provisions by the bounty of the officers. Upon the scurvy breaking out in *December*, his supply of fresh provisions was stopt, and given to more necessitous objects, as was thought, he being then pretty healthy. Upon which he fell into a bad scurvy: the first symptom of which that appeared, was the breaking out of the late wounds in his arm. He sunk under the discharge, and died at *Mabon* hospital.

difficulty

difficulty wiped off, or separated from the parts below. The flesh underneath these sloughs feels to the probe soft or spongy, and is very putrid. No detergents or escharotics are here of any service: for though such sloughs be with great pains taken away, they are found again at next dressing, where the same sanguineous putrid appearance always presents itself. Their edges are generally of a livid colour, and puffed up with excrescencies of proud flesh arising from below under the skin. When too tight a compression is made, in order to keep the *fungus* from rising, they are apt to have a gangrenous disposition; and the member never fails to become œdematous, painful, and for most part spotted. As the disease increases, they at length come to shoot out a soft bloody *fungus*, which the sailors express by the name of *bullocks liver*: and indeed it has a near resemblance, in consistence and colour, to that substance when boiled. It often rises in a night's time to a monstrous size; and although destroyed by cauteries, actual or potential, or cut smooth with a bistory, (in which case a plentiful hæmorrhage generally ensues), is found at next dressing as large as ever. They continue how-

U

ever

ever in this condition a considerable time, without affecting the bone.

The slightest bruises and wounds of scorbutic persons degenerate into such ulcers. Their appearance, on whatever part of the body, is so singular and uniform, and they are so easily distinguished from all others, by being so remarkably putrid, bloody, and fungous, that we cannot here but take notice of the impropriety of referring most of the inveterate and obstinate ulcers on the legs, with very different appearances, to the scurvy; which are generally best cured by giving mercurial medicine: whereas that medicine, in a truly scorbutic ulcer, is the most dangerous and pernicious that can be administered.

But to proceed: The first remark to be made upon this disease, is, that whatever former ailment the patient has had, (especially rheumatic pains, aches from bruises, hurts, wounds, &c.), or whatever present disorder he labours under; upon being afflicted with this distemper, his former and old complaints are renewed, and his present malady, whatever it may be, rendered worse. Scorbutic people, as the disease advances, are seldom indeed free from complaints, especially of pains; though they

they have not the same seat in all, and even in the same person often shift their place. Some complain of universal pain in all their bones, as they express it; most violent in their limbs, and small of the back, and especially on their joints and legs when swelled. But the most frequent seat of their pain is in some part of the breast; a tightness and oppression there, with stitches felt upon coughing, being usual symptoms in this disease. And as scorbutic pains in general are very liable to move from one place to another, so they are always exasperated by motion of any sort, especially the pain of the back; which, upon this occasion, proves very troublesome.

The next thing observable here, is, that whatever diseases are epidemical at the same time with the scurvy, or even whatever intercurrent diseases prevail, these scorbutical habits are very liable to be seized with. And this sometimes happens when such distempers would appear to be of a pretty opposite genius to the scurvy; in which case it is lucky for the patient. But, on the contrary, if the prevailing distempers are of a putrid nature, such as the small pox, measles, dysenteric fever, &c. it is then, that, co-operating with the scorbutic acrimony,

mony, they produce the most fatal and malignant symptoms.

I observed a considerable difference in the genius of the disease in the two cruises *ann.* 1746 and 1747. In the latter, when fevers from cold of the pleuritic and peripneumonic sort prevailed, it tended chiefly to affect the breast with a tightness, oppression, and a hard bound cough, by which a very viscid phlegm was with great difficulty brought up. The fits of coughing were not constant, but extremely fatiguing; and this was a universal complaint. Several at this season were feverish; we had none in a salivation, and the fluxes were mild and manageable. Whereas in the year 1746, when a different species of diseases prevailed, occasioned by the unwholesome newness of the ship's timbers, and diarrhæas were frequent, the scurvy proved more virulent and fatal. Its worst, most common, and troublesome symptoms, were salivations and dysenteries, especially the latter; in which one *Nichols* died, and eight or ten more were landed at *Plymouth* in a very low and exhausted condition by it. I did not at that time remark any of them to be feverish, and their breasts were but slightly affected. *John Hearn* was our patient
in

in both cruises. His case begins in my diary, under the 24th of June 1746, thus. He has been afflicted with the scurvy for some time past. It first appeared with sore spongy gums, pain and œdematous swellings of his legs, weakness, &c. Has taken *elixir vitriol* twice a-day for a considerable time, but grows daily worse. Has a continual salivation, at the rate of two quarts in twenty-four hours, attended with severe gripes and *tenesmus*. The salivation soon stopt; but was followed with a violent dysentery, which continued until he was landed. I find him again mentioned under the 15th of May 1747. *J. Hearn* complains of a lassitude and stiffness of his limbs, with pain in his back. Upon examination, we find his legs covered with red, black, and livid spots; his gums are swelled; his chief complaint is a troublesome fatiguing cough. And this last was what afflicted him most during the whole cruise.

I believe indeed it will universally be found, that, in the progress of this distress, the breast is always more or less affected, unless the belly is very open. The pain shifts from one part of it to another, often to opposite sides, and is at first perceived upon coughing

ing only: but when the malady is farther advanced, it commonly fixes in a particular part, most frequently in the side; where it becomes extremely severe and pungent, so as to affect the breathing; a dangerous symptom in this disease (*e*).

The head is seldom or never affected with pain, unless the patient is feverish. As to fevers, it may indeed be doubted whether there be any such as are purely and truly scorbutical; the disease being altogether of a chronic nature, and fevers may be justly reckoned amongst its adventitious symptoms. I have been told by a very intelligent surgeon, who has had opportunity of seeing some hundred scorbutical cases, and those of the worst kind, that he remarked very few of them to be attended with fevers; which, to the best of his remembrance, always proved mortal. And I am convinced, that fevers of any sort do prove fatal,

(*e*) *Mr Murray's remark.*—This pain in some measure answers to the description of the *pleuritis notha*; and, like it, is sometimes, but not always, to be relieved by blisters: the application of which however is not here safe, as there is some danger of a gangrene from them. I have likewise often observed a pain of the breast, I think mostly in the left side, in scorbutic fluxes, and always found it mortal.

though

though they very seldom occur, in the last stage of the malady (*f.*)

I observed before, that, in the year 1746, none of our scorbutical patients were feverish: but, in the cruise in the year 1747, several had the fever in the beginning of the distemper. The symptoms were not so violent nor inflammatory in scorbutical people, as in others. In two or three it assumed an intermitting form; and in this state I observed it to be altogether mild, and without danger.

One *Daniel Harlybee* having an obstinate ulcer on his shin, his legs, about the beginning of *May* 1747, became painful and œdematous, and his ulcer truly scorbutic. On the 12th of that month he was seized with a pretty smart fever; which abated the next day,

(*f*) *Ives.*—I cannot say I have ever seen an instance of it: for I do not remember, nor can I find in my journals, one case of a person advanced in the scurvy being seized with a fever. I entirely agree with you, that this disease is purely chronic. Ulcerated lungs is a common consequence of the scurvy; and where there has been a violent cough and stitches preceeding, 'tis certain I may have perceived the pulse to have quickened, and possibly too an increase of heat in the skin: yet these circumstances seemed to me altogether symptomatic, and not properly to be denominated a fever with the scurvy; for, after a rupture in the pulmonic texture, the commotion of the blood, and heat of the body, generally cease.

but

but returned regularly every third day for five weeks, till he arrived at *Plymouth*. His gums were putrid; he had a pain in his breast, together with a cough, and the other scorbutic symptoms usual at that season.

But of all species of fevers that may be superadded to this disease, the most terrible, more so perhaps than even the plague itself, is that of the petechial fever, or jail-distemper, as it is called; which has sometimes been contracted in large, crowded, and sickly ships; either from infection, or by keeping scorbutical patients long confined in a foul putrid air (g).

Lastly,

(g) Of this indeed I have never seen an instance; but have been favoured with the following account of it from Mr *Murray*, when surgeon of the *Canterbury*.

He observed in that ship, during an epidemical rage of the scurvy, when at the same time they had on board some petechial fevers, that several were seized with a slight fever, which was abated the third or fourth day, upon the appearance of a miliary, erysipelatous, or herpetical eruption, for the most part on the inferior extremities. These eruptions gradually grew livid, from thence black and gangrenous; attended with, or producing sordid and sanious ulcers, *spinæ ventosæ*, and *caries* of the most obstinate and dangerous kind; spreading always upwards, seldom or never downwards. The gums were in this case lax, not much swelled, but often bleeding; and soon attended with *caries* of the jaw, from the sockets of which the already loosened teeth easily dropped out. The patient was continually thirsty; the skin dry and hot; the pulse small and quick; the eyes sometimes staring, oftener moving quick, and
looking

Lastly, According to the habit and constitution of the patient, there will occur likewise some little diversity in the state of the body in this disease: some through the whole course of it being regular enough in their belly, while others are apt to be very costive; but generally scorbutic persons are inclinable to loose stools at times, which in all are remarkably foetid. The urine I found to be extremely various at different times, even in the same patient; except that it is generally high coloured, and soon becomes rank and foetid (*b*). The pulse likewise varies according to the habit of the patient, and state of the malady; being most commonly lower and feebler than when in health (*i*).

The

looking wild, with a despairing moving aspect; the tongue moist and tremulous; the patient restless, and sometimes delirious. This dreadful evil soon carried off the unhappy sufferer, if remedies were not immediately administered; or rather Nature had not strength enough to disburthen herself upon some of the extremities, especially the inferior, as before remarked, generally a little below the knee; where carious or cancerous ulcers made quick ravage, were attended with the most exquisite pain, and often quickly dispatched the patient, blessing him with death.

(*b*) *Mr Murray's remarks.*—The urine of almost all scorbutic persons, when let stand, gathers an oily saline scum above.

(*i*) *Mr Murray.*—Where there is fever, the pulse is generally small, but hard and quick. You say, that *Eugalenus*, and

The true scorbutic spots, as was said before, are always flat, and equal with the surface of the skin. I have, however, observed the legs, at the same time when greatly swelled, sometimes covered with a dry scurf or scales. At other times, though very rarely, there appear on the skin small eruptions of the dry miliary kind.

IN the second stage of this disease, they most commonly lose the use of their limbs; having a contraction of the flexor tendons in the ham with a swelling and pain in the joint of the knee. Indeed a stiffness in these tendons, and a weakness of the knees, appear pretty early in this disease, generally terminating in a contracted and swelled joint. They are subject to frequent languors; and when long confined from exercise, to a proneness to faint upon the least motion of the body; which are the most pecu-

the authors who have followed him, tell us, that in scorbutic faintings, the pulse rises and becomes stronger. This singularity I think, I must have observed, had it been so. In such cases the pulse is for most part obscure and small; sometimes rising all of a sudden for a few strokes, soon sinking, and always intermitting. In the fever mentioned, unless a flux accompanied it, faintings were less frequent: the pulse was quick and separated, and sometimes run like quick-silver in a flexible tube pushed along by starts.

lar, constant, and essential symptoms of this stage.

Some have their legs monstrously swelled, and covered with one or more large livid spots, or *ecchymoses*; others have hard swellings here in different places, extremely painful; and others I have seen, without any swelling, have the calf of the leg (*k*) quite indurated.

They are apt, upon being moved, or exposed to the fresh air, suddenly to expire. This happened to one of our people, when in the boat, going to be landed at *Plymouth* hospital. It was remarkable he had made shift to get there without any assistance, while many others were obliged to be carried out upon their beds. He had a deep scorbutical colour in his face (*l*), with complaints in his breast. He panted for about half a minute, then expired (*m*).

Scorbutic people are at all times, but more especially in this stage, subject to profuse hæmorrhages from different parts of the body; as from the nose, gums, intestines, lungs, &c.

(*k*) *Mr Ives*.——And thighs too.

(*l*) *Mr Murray's remark*.——In this stage I have seen livid maculæ, or spots, on the face.

(*m*) *Mr Ives*.——Of this I have seen many instances, when they are imprudently brought up from the orlope to the fresh air. The utmost caution and circumspection are here requisite.

and from their ulcers, which generally bleed very plentifully. Many at this time are afflicted with violent dysenteries, accompanied with exquisite pain; by which they are reduced to the lowest and most weakly condition: while others I have seen, without a diarrhæa or gripes, discharge great quantities of pure blood by the *anus*.

The gums are for the most part excessively fungous, with an intolerable degree of stench, putrefaction, and pain; sometimes deeply ulcerated, with a gangrenous aspect. But I never remarked, except in cases of salivations, the back part of the throat, or upper part of the mouth, much affected; and I believe the lips seldom or never are. The teeth most commonly become quite loose, and often fall out; but a *caries* of the jaw does but rarely follow.

Upon this occasion it must be noted, that a scorbutic *caries* happens only in two cases. *First*, If the outer *lamella* of a bone has been broken off, so as that the scorbutic corrosive humour, stagnating in any of the cavities of the body, has access to the internal cellular substance, it speedily corrupts and gangrenes it. But otherwise ulcers continue long on the spine of the *tibia*, and other parts, without affecting the

the bone; except in another and rare case; which is, when, by the deepest and most virulent infection, this cellular substance becomes tainted; which is commonly attended with excruciating pain, and always with an enlargement of the bone, or rather an *exostosis*, often the *spina ventosa*, followed with painful spreading ulcers, and an internal *caries* of the most malignant kind (*n*).

Most, although not all, even in this stage, have a good appetite, and their senses entire, though much dejected, and often low spirited. When lying at rest in their beds, many make no complaint, either of pain or sickness, unless afflicted with the dysentery, or a troublesome salivation. This last indeed I am inclined to think would happen but seldom, were it not occasioned by the exhibition of some mercurial medicine (*o*) in the cure of ulcers, or other scorbatical

(*n*) *Mr Murray*.—I never observed a carious bone to follow, but where there was a fever and most virulent scurvy.

(*o*) *Mr Ives*.—Did you in 1746 exhibit mercurials? If not, how do you account for the salivations that happened then? They would appear to me to have been purely scorbutic. I do not remember an instance of any considerable salivation in the scurvy. *Answer*. It appears from my diary, that we had then three patients in a salivation, *viz.* *Rice Meredith, Robert Robinson, and John Hearn*. The two first had taken gentle doses of
mercurius

scorbutical complaints, where it is often injudiciously administered; which, in such cases in extreme small quantity, induces a copious and dangerous salivation, almost always attended with the dysentery. These succeed each other alternately; so that the spitting generally ceases for a day or two, while the patient is racked with gripes, and bloody stools; which being stopt for a little, the salivation again returns.

IT is not easy to conceive a more dismal and diversified scene of misery, than what is beheld in the third and last stage of this calamity; it being then that the anomalous and more extraordinary symptoms most commonly occur. It is not unusual at this time, for such persons as have had ulcers formerly healed up, to have them break out afresh: while in others the skin of their swelled legs often bursts, particularly where soft, painful, livid swellings, have been first observed; and these degenerate into such crude, bloody, fungous ulcers, as formerly described. Some few at this period (though very rarely) fall into colliquative putrid fevers

mercurius alcalisatus, and about half a dram of mercurial pill: but there is no mention of their having been given to *Hearn*. I am pretty clear he took no mercury.

attended

attended almost always with *petechiæ*, foetid sweats, &c. or rather sink under profuse evacuations of rotten blood, by stool and urine, from the lungs, nose, stomach, hæmorrhoidal veins, &c. (*p*): while the disease more frequently in others, by occasioning obstructions and putrefaction in the abdominal *viscera*, gives rise to a jaundice, dropsy, and the *affectio hypochondriaca*, or the most confirmed melancholy and despondency of mind, attended with severe nervous rigors; as also to violent colics, obstinate costiveness, &c.

Towards the close of this malady, the breast is most commonly affected with a violent and uneasy straitness and oppression, and an extreme *dyspnœa*; accompanied sometimes with a pain under the *sternum*, but more frequently in either of the sides: while others, without any complaint of pain, have their respiration become quickly contracted and laborious, ending in sudden, and often unexpected death.

Many more symptoms might be here added that at times have been observed, especially towards the close of this most virulent disease. And we shall have no occasion to be surpris'd, even at the most extraordinary which have been

(*p*) *Ives.*—All which I have often seen, except the fever.
related

related by authors, when we come, in its proper place (*q*), to view the true state of the body at this period, with the high degree of putrefaction in the blood, the other humours, and *viscera*.

I have been told by some practitioners, that this is a disease not met with in people living at land in *Great Britain*. To such gentlemen I would recommend the serious perusal of an excellent chapter (*r*) in *Dr Huxham's* late essay on fevers, where they will be made better acquainted (as is very necessary) with what is truly the scorbutic *diathesis*. Whatever number or diversity of symptoms may occur in this evil, from difference of constitution, and especially at sea, from the influence of such powerful causes as subsist there; yet putrid gums, bluish and black spots on the body, constitute its characteristic and pathognomonic signs every where.

As the before mentioned learned author, my honoured friend, has published several very curious and truly scorbutical cases which occurred in *England*; I shall conclude this chapter, after giving a case somewhat more out of

(*q*) Chap. 7. dissections.

(*r*) Chap. 5. on the putrid and dissolved state of the blood.

the common road, with an account of some scurvies in *Scotland*.

(*f*) Lieutenant *John A*— of marines, aged 40, was formerly extremely healthy, though much at sea; where he had seldom or never eat of salt provisions, officers tables being generally well provided with better fare. He had lately returned from some *Channel* cruises to the westward; where, as usual, he had not eat of any thing salt, having a natural aversion to such food. One day, to his great surprize, he observed on about the middle of one of his legs a considerable bunching up from over the *tibia*; and, taking down his stocking, found a bluish insensible swelling. Next morning it was increased to the size of a large walnut; and in two or three days the skin broke, and it became a genuine scorbutic ulcer, with the liver-like *fungus*. After which began also other symptoms; change of colour, tightness in the breast, rotten gums, and, what was very threatening to his life, an obstinate constipation of the bowels, attended with intolerable gripings.

He took country-lodgings; and, being pro-

(*f*) Communicated by Mr *Ives*.

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perly

perly treated, in about six weeks, or two months, recovered.

*Letter from Dr James Grainger (t), surgeon
Lt-Gen. Pultney's regiment.*

I Have extracted from my notes the following brief description of the scurvy, which prevailed *ann.* 175 $\frac{1}{2}$, among the six companies of our regiment quartered at *Fort-William*.

I had then an opportunity of seeing it in not less than near 100 patients; and must ingeniously own, it was there I learned my first lesson upon the disease.

My predecessor had not informed me, that this was a disorder of that garrison; it was a subject of which I had read much, but knew little; so that the first I treated, had well nigh fallen a martyr to improper prescription. The pains this soldier complained of, appeared to me rheumatic. This I the more easily gave into, at that time this disease was actually frequent. He was bled, and treated accordingly; upon which his pains grew worse than ever, and I wonder. I began to talk seriously to him, at

(t) The ingenious author of *Historia febris anomal.* *Bate* *ann.* 1746, &c.

upbraided him with having pretended complaints more than real. But he soon gave me evident marks of real distress. Livid spots on the thighs, rotten, bleeding gums, and his stinking breath, quickly convinced me, that I had mistaken his case, and consequently his method of cure.

At aliquis malo fuit usus in illo.

The scurvy now began to spread, and I profited by my former inattention.

Its first appearances were, *lassitudo*, breathlessness upon the least quickness of motion, and a taste in the mouth peculiarly disagreeable: which were soon followed by rotten, spongy, painful gums, bleeding from the slightest touch; foetid breath; pains always of their thighs, frequently of their legs, sometimes of their loins, seldom of their arms. All these parts were sometimes discoloured with purple *maculae*, which, as the malady increased, grew black and broad. The anterior parts of the legs and thighs chiefly suffered. The former I have seen all livid, the latter very closely spotted. Neither were much swelled, yet both were harder than usual; and so extremely painful, that the gentlest touch gave agony. Unless these were

speedily checked, the contagion spread, their faces grew strangely fallow, their teeth loosened, palate and *fauces* ulcerated, asthma increased, they fell away, slept little, old ulcers broke out again, cried out when turned a-bed, and sometimes fainted upon motion of their body.

What surprised me most, was, that their appetite, even in these deplorable circumstances was not greatly impaired; and that none of them could properly be said, though thirsty, to be in a fever. All of them were rather costive and their urine, though not copious, was always vastly foetid and thick, in those especially who complained of their loins. Most of them were continually spitting; and a small quantity of mercury occasioned a dreadful salivation.

A soldier who laboured under the venereal disease, used but a dram of crude mercury, by way of unction, one evening. Next morning I found him in a true mercurial salivation. The spitting went on, increasing until the tenth day when the inside of his mouth, lips, and cheeks became monstrously swelled. The stench of his mouth was intolerable to all about him. He every day spit out a quantity of foetid blood, part of his gums, and teeth. He lost almost all the latter; and what was very remarkable, they

were

were found preternaturally enlarged. His urine was extremely foetid, thick, and almost blackish. He often fainted away. In short, the poor fellow was reduced to the most deplorable condition, and with great difficulty escaped. It was three months afterwards before he was fit for duty.

The scurvy began in *March*, raged in *April*, declined in *May*, and left us before the middle of *June*. Ninety during that period had scurvy at *Fort-William*; while there were only two soldiers out of four companies seized with it at *Fort-Augustus*, and but one in a Captain's command at the barracks of *Berneria*. These three indeed were very bad. No officer had it in any one of these garrisons.

I imputed the malady to the following causes. 1^{mo}, Constant moist, rainy weather. 2^{do}, Salt provisions from *December* till near the end of *May*, salt butter, cheese, oat-meal. 3^{tio}, Few or no vegetables; little, bad, or no milk. 4^{to}, Indifferent water. 5^{to}, Hard duty. The 1st, 3^d, 4th, 5th causes prevailed less at *Fort-Augustus* and *Berneria*; and therefore these places had not their proportion of scorbutical patients.—(u)

(u) See the remainder of this letter, chap. 5.

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This disease is in several parts of *Scotland* called by the name of the *black leg*. It has often been very epidemic and fatal to the miners at *Strontian* in *Argyleshire*. Not long ago many of them died of it, with this remarkable symptom, that the hypochondria and lower belly were at length covered with large scorbutic maculæ. This *Dodonæus* (x), a good author on the scurvy, long ago observed to be a mortal symptom.

I am informed of a certain Noble family whose seat in the country is bleak, and exposed to the sea, where they have been universally afflicted with spongy, rotten gums, swelled legs, ulcers, &c.

Lately a gentleman confined in jail at *Edinburgh*, complained of a swelling of his legs. Upon examination, they were found covered with black and bluish spots; soon after his gums became extremely putrid and fungous. His case being neglected, a *caries* of the lower jaw ensued; for which he was put under my care.

A navy-surgeon residing in *Fife*, in passing by *Backhaven*, was desired to visit two poor fellows who were extremely bad. He found them in a

(x) Vid. Part 3.

miserable condition indeed! Their gums were monstrously putrid, their bodies spotted, and they were altogether deprived of the use of their limbs, by a swelling in the joint of the knee; in one of them the tendons in the ham were contracted, and quite indurated. The gentleman acquainted them with the nature of their malady, and by a proper prescription restored them soon to health (*y*).

C H A P. III.

The prognostics.

FOR the better understanding of this, and some of the following chapters, it becomes necessary to make a distinction, which is to be attended to. It is, That this disease may be either adventitious, or constitutional; artificial, (if I may be allowed the term), or natural to the patient. The first is the case of most seamen, and of all sound constitutions, either at sea or land, who have contracted the taint from such obvious external causes as were before mentioned (*a*); in whom it is an artificial

(*y*) See the prescription, chap. 5. (*a*) Part 2. chap. 1.

or adventitious disease. But there are likewise many to be met with, living at land, who from very slight causes, are liable to become scorbutic; and that from a certain indisposition of their own body: and in such the malady is to be deemed constitutional, or natural to the patient. Though in whatever manner it is induced, the distemper is still the same, and the like method of cure is proper for its removal; so I shall have no occasion to mention this distinction again; but am here to advertise the reader, that several of these prognostics are chiefly applicable to the artificial scurvy.

Persons who have been weakened by other preceeding distempers, such as fevers or fluxes, or by tedious confinement and cures, as those who have undergone a salivation, are of all others most subject to this disease. Intermitting fevers in a particular manner dispose the constitution to it.

Those who have formerly been afflicted with it, are much more liable to it, in parallel circumstances, than others.

Different seasons variously affect scorbutic ailments. At land they become troublesome, when the winter's rain and cold begin to set in towards the autumnal equinox; cold, moist,

moist, open winters greatly inforce the disease; but by the return of warm dry weather, these scorbutic complaints are much mitigated.

Where the indisposition is but beginning, and even when the gums have been pretty much affected, there are numerous instances of a perfect recovery, without having the benefit of fresh vegetables; provided the patient is able to use due exercise. But when confined to bed, or prevented from using exercise, by swelling of the legs, weakness, or from other causes, the evil, where no green vegetables or fruits can be procured, infallibly increases; and when it is advanced to what I have called the *second stage*, is not to be cured without them. Of which many instances might be produced, particularly from the hospital at *Gibraltar*; where several died most piteous objects in this distress, notwithstanding they had the benefit of the land-air, and plenty of excellent fresh flesh-broths; when a small quantity of greens every day, would in all probability have saved their lives.

This disease, when adventitious, may in its first, or even its second stage, be cured by fresh greens and proper treatment, (especially

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by the use of oranges and lemons), on board a ship, either in harbour or at sea.

The symptoms related to occur in the last stage, are of all others the most dangerous *viz.* oppression on the breast, obstinate costiveness, stitches in the side, and frequent faintings; but especially great difficulty of breathing.

At sea, where no greens, fresh meats, or fruits are to be had, the prognostics in this disease are sometimes deceitful; for people that appear to be but slightly scorbutic, are apt to be suddenly and unexpectedly seized with some of its worse symptoms.

Their dropping down dead upon an exertion of their strength, or change of air, is not easily foretold; though it generally happens after a tedious confinement in a foul air.

The first promising appearance in bad cases when fruits or greens are first allowed, is the belly becoming lax; these having the effect of a very gentle physic; and if in a few days the skin becomes moist and soft, it is an infallible sign of their recovery; especially if they bear gentle exercise, and change of air, without being liable to faint. If the vegetable aliment restores them in a few days to the use of their

limb

gums (*b*), they are then past all danger of dying at that time of this disease; unless afflicted with the scorbutic dysentery, or the hæmorrhoidal disorder. These two often prove fatal, and are the most obstinate to remove of all the scorbutic symptoms.

The blackness of the skin, or spots, upon recovery, go off nearly in like manner as other *macchymoses*, growing gradually yellow, from the circumference to the center; the natural colour of the skin returning in the same manner.

A deep scorbutical taint, where the breast has been much affected, often ends in a consumption. Others have contracted a dropical disposition from this disease; or, what is more frequent, swelled, œdematous, and ulcerated legs. Such persons are likewise subject, in different periods of their life afterwards, to chronic rheumatisms, pains and stiffness in their joints; and sometimes to cutaneous eruptions, or a foulness of the skin (*c*).

C H A P.

(*b*) *Mr Ives.*—The contraction of their knees sometimes can never be cured; as happened to one of our marines, *Samuel Norton*, who, although he recovered from the other symptoms of a deep scurvy, yet never did of this contraction; and upon that account was discharged as an invalid from the service, with his heel almost touching his buttock.

(*c*) *Mr Murray's remark.*—The gums especially are left
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considerably

C H A P. IV.

The prophylaxis, or means of preventing the disease, especially at sea.

FOR the prevention of this disease at land a warm, dry, pure air, with a diet of easy digestion, consisting chiefly of a due mixture of animal and vegetable substances, (which is found to be the most wholesome food, and agreeable to the generality of constitutions) will for the most part prove sufficient.

Those who are liable to it by living in marshy wet soils, and in places subject to great rain and fogs; and others who inhabit unwholesome damp apartments, as the lower floors and cellars of a house in winter, should remedy these inconveniencies by keeping constant fires, to correct this hurtful moisture; which will still prove more effectual for the purpose, if made of aromatic woods. But it is rather advisable for persons threatened with this malady, to remove into dry, chearful, and better-aired

considerably affected, either by being eat away, and leaving the teeth too bare; or remaining lax, and covering too much of them; and being subject to bleed on the slightest touch.

habitations

abitations. Their principal food in such a case should be broths made of fresh flesh-meats, together with plenty of recent vegetables, if they can be procured; otherwise of preserved roots and fruits. Their bread ought to be made of wheat-flour, sufficiently leavened, and well baked; and at their meals they are to drink a glass of good sound beer, cyder, wine, or the like fermented liquor. The observance of these directions, together with moderate exercise, cleanliness of body, ease and contentment of mind, procured by agreeable and entertaining amusements, will prove sufficient to prevent this disease from rising to any great height, where it is not altogether constitutional.

In towns or garrisons when besieged, officers should take care that the beds, barracks, and quarters for the soldiers, be kept dry, clean, and warm, for their refreshment when off duty; and that their men be sufficiently provided with thick cloaks and warm cloaths, for shelter against the inclemency of cold, and rains, when necessarily exposed to them. The ammunition-bread should be light, and well baked, and their other provisions as sound and wholesome as possible. To correct the too gross and
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solid quality of these, they would do well to join vegetables, even the most common, and such as are to be met with on the ramparts with their other food. This precept becomes still more necessary when the garrison's provisions in store are spoiled or unsound; in which case the use of vinegar is recommended by several authors. *Bachstrom's* advice, of sowing the seeds of the antiscorbutic plants (*a*), so that these may grow up with the grass on the ramparts, will, upon this occasion, be found very beneficial. They can indeed be under no difficulty in procuring some of the most salutary of them at all times, if they are provided with their seeds, such as the garden-crelles; which, in a few days, even in their apartments, will supply them with a fresh antiscorbutic salad. When the army is in the field, they generally meet with such plenty of wholesome vegetables as are sufficient to prevent this disease becoming fatal to many of them, except in desert and depopulated countries.

But the prevention of this calamity at sea, and the preservation of a truly valuable part of mankind, *viz.* the seamen of all nations, from its fatal and destructive malignity in long voyages

(*a*) *Vid. Observationes circa scorbutum, &c. p. 36.*

and cruises, is what in a particular manner demands our attention, and has exercised the genius of some of the most eminent physicians in all parts of *Europe* for above a century past.

A *German* who had acquired a considerable fortune in the *East Indies*, by being *Dutch* Governor of *Sumatra*, was so affected with pity and humanity for the many afflicted sailors he had observed in this malady, that, imagining the art of chemistry, which at that time made a great noise in the world, might probably furnish some remedy for their relief, he erected and endowed a perpetual professorship of that science at *Leipsic*. He nominated his countryman Dr *Michael*, a very great chemist, who was the first university-professor of chemistry in *Europe*; and remitted him a considerable sum of money, in order to bear the expence of his experiments, with the promise of a much greater, in case he succeeded in the discovery of a remedy for prevention of the scurvy at sea. The Doctor spent an incredible deal of time and labour in preparing the most elaborated chemical medicines. Volatile and fixed salts, spirits of all sorts, essences, elixirs, electuaries, &c. were yearly sent over to the *East Indies*; nay even the *quinta essentia* (which became

became afterwards a celebrated *nostrum* for the scurvy in *Germany*) of the chemical oil of the seeds of scurvy-grass. But all proved ineffectual.

Bontekoe recommended to the *Dutch* sailors an acrid alkaline spirit; *Glauber* (b) and *Boerhaave*, a strong mineral acid, viz. *sp. salis*. The Royal navy of *Great Britain* has been supplied, at a considerable expence to the government, by the advice of an eminent physician, with a large quantity of *elixir* of *vitriol* which is the strong mineral acid of *vitriol* combined with aromatics. Wine-vinegar was likewise prescribed upon this occasion by the college of physicians at *London*, when consulted by the Lords of the Admiralty; which differs from all the former, being a mild vegetable acid procured by fermentation. Vinegar has been indeed much used in the fleet at all times. Many ships, especially those fitted out at *Plymouth*, carried with them cyder for this purpose, upon the recommendation of the learned *Dr Huxham*. The latest proposal to the Lords of the Admiralty was a magazine of dried spinage prepared in the manner of hay. This was to be moistened and boiled in their food. To which it was objected by a very

(b) In his book, intitled, *Consolatio navigantium, &c.*

ingenious physician (c), That no moisture whatever could restore the natural juices of the plant lost by evaporation, and, as he imagined, altered by a fermentation which they underwent in drying.

Moreover, all the remedies which could be used in the circumstances of sailors, that at any time have been proposed for the many various diseases going under the name of a *scurvy at sea*, have likewise been tried to prevent and cure this disease at sea: the effects of several of which, besides the before mentioned, I have myself experienced, *viz.* salt water, tar-water, decoctions of guajac and sassafras, bitters with *ort. winterani*; and such warm antiscorbutics as can be preserved at sea, *viz.* garlic, mustard-seed, *pulv. ari comp. et spirit. cochlear.*; which last was formerly always put up in sea-medicine chests. I have also in various stages, and for different symptoms of this distemper, made trial of most of the mineral and fossil remedies

(c) *Dr Cockburn.*—The Doctor's judgment is fully confirmed by experience. We find the college of physicians at *Vienna* sent to *Hungary* great quantities of the most approved antiscorbutic herbs dried in this manner; which were found to be of no benefit. Many of these would have their virtues as little impaired by drying as spinach, *e. g.* marsh trefoil. *Kramer* tried almost every species of dried herbs to no purpose. Vid. part. 3. chap. 2.

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which have been recommended for the scurvy at land; such as mercurial, chalybeate, antimonial, vitriolic, and sulphureous medicines. But, before I mention the result of these experiments, and the observations made upon the effects of several remedies that have been most approved of in this disease, it may not be amiss to take notice, that the want of success hitherto in preventing this fatal malady at sea, seem chiefly owing to these two causes.

1st, The methods of preservation have been put in practice too late; that is, when the disease was already bred; it being generally then that *elixir vitriol*, vinegar, cyder, and other antiscorbutics, were administered: whereas certain precautions seem necessary to prevent the first attacks; it being found, that almost all diseases are easier prevented than afterward removed.

2^{dly}, Too high an opinion has been entertained of certain medicines recommended by physicians at land, rather from a presumption founded on their theory of the disease, than from any experience of their effects at sea. Indeed the causes which they were supposed to obviate, were often none of the true and real occasions of the distemper. Thus lime-water
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has been long since prescribed to correct the too great quantity of sea-salt necessarily used by sailors. And the college of physicians at *London* gave it as their opinion, that *Lowndes's* salt made from brine was preferable for salting sea-provisions, to that made of sea-water, even to the bay-salt; from a suspicion of some noxious qualities in this salt which might occasion the scurvy. *Sp. sal, el. vitriol*, and vinegar, were deemed proper antidotes to the rank and putrid state of sea-provisions, and water; or perhaps to the putrescent state of the humours in this disease.

But whatever good effect for the last purposes these may be supposed to have had in a smaller degree; yet experience has abundantly shewn, that they have not been sufficient to prevent this disease, much less to cure it. And the same may be said of many others. The consequence of which is, the world has now almost despaired of finding out a method of preventing this dreadful evil at sea; and it is become the received opinion, that it is altogether impossible there, either to prevent or cure it. But it is surprising, that this ill-grounded belief, so fatal in its consequences, should have gained credit, when we see people recovering from this disease every day, (even in the most deplorable

rable condition, and in its last stages), in a short time, when proper helps are administered. I have already given an instance of seventy people cured in the bad air of a ship, without being landed (*d*). I shall hereafter produce other instances of this disease being cured at sea, though these must have occurred to every person who has had occasion there to be conversant with scorbutical cases (*e*).

It may be proper, in order fully to remove this prejudice, to observe, that an epidemical scurvy, either at sea or land, is an adventitious, not a natural disease: that is to say, it is not owing to any spontaneous degeneracy of the human body, from a healthful condition into this morbid state; but to the influence of very powerful and active, but such plain and obvious causes as have been before assigned (*f*). And it is constantly experienced, that when these causes do not subsist, or are corrected and guarded against, the disease may be effectually prevented. This will admit of a demonstration from many facts. Officers are seldom or

(*d*) P. 99.

(*e*) Many instances have already been given in Mr Ives' journal, part 2. chap. 1.

(*f*) Part 2. chap 1.

never affected with the scurvy; even the subaltern and petty officers generally keep free from it, while it commits great ravage among the common seamen. There have occurred frequent instances of *English* and *Dutch* ships being in company together, where the former were in great distress from this disease; while the latter, by a very small difference in their diet, were quite healthy. But what is sufficient to convince the greatest sceptic, that this calamity may be effectually prevented, is the present healthfulness of *Newfoundland*, the northern parts of *Canada*, and of our factories at *Hudson's bay*. In those parts of the world, the scurvy was formerly more fatal to the first adventurers and planters, than it was ever known at sea; which facts I shall have occasion presently to mention, and account for. And as it is a satisfaction to know that this disease may effectually be prevented, so it is likewise an encouragement to the utmost diligence in discovering, and putting in practice, the means proper for that purpose.

It being of the utmost consequence to guard against the first approaches of so dreadful an enemy, I shall here endeavour to lay down the measures proper to be taken for this end, with
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that minuteness and accuracy which the importance of the subject, and the preservation of so many valuable and useful lives, justly demand; and at the same time shall, as much as possible, avoid offering any thing that may be judged impracticable, or liable to exception on account of the difficulty or disagreeableness of complying with it. And, *lastly*, I shall propose nothing dictated merely from theory but shall confirm all by experience and fact the surest and most unerring guides.

What I propose is, first, to relate the effects of several medicines tried at sea in this disease on purpose to discover what might promise the most certain protection against it upon that element.

The medicine which succeeded upon trial I shall afterwards confirm to be the surest preservative, and most efficacious remedy, by the experience of others.

I shall then endeavour to give it the most convenient portable form, and shew the method of preserving its virtues entire for years so that it may be carried to the most distant parts of the world in small bulk, and at any time be prepared by the sailors themselves adding some farther directions, given chiefly
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with a view to inform the captains and commanders of ships and fleets, of methods proper both to preserve their own health, and that of their crews.

It will not be amiss further to observe, in what method convalescents ought to be treated, or those who are weak, and recovering from other diseases, in order to prevent their falling into the scurvy; which will include some necessary rules for resisting the beginnings of this evil, when, through want of care, or neglect, the disease is bred in a ship.

As the salutary effects of the prescribed measures will be rendered still more certain, and universally beneficial, where proper regard is had to such a state of air, diet, and regimen, as may contribute to the general intentions of preservation or cure; I shall conclude the precepts relating to the preservation of seamen, with shewing the best means of obviating many inconveniencies which attend long voyages, and of removing the several causes productive of this mischief.

The following are the experiments.

On the 20th of *May* 1747, I took twelve patients in the scurvy, on board the *Salisbury* at sea. Their cases were as similar as I could have

have them. They all in general had putrid gums, the spots and lassitude, with weakness of their knees. They lay together in one place, being a proper apartment for the sick in the fore-hold; and had one diet common to all, *viz.* water-gruel sweetened with sugar in the morning; fresh mutton-broth often times for dinner; at other times puddings, boiled biscuit with sugar, &c.; and for supper, barley and raisins, rice and currants, sago and wine or the like. Two of these were ordered each a quart of cyder a-day. Two others took twenty-five gutts of *elixir vitriol* three times a-day, upon an empty stomach; using a gargle strongly acidulated with it for their mouths. Two others took two spoonfuls of vinegar three times a-day, upon an empty stomach; having their gruels and their other food well acidulated with it, as also the gargle for their mouth. Two of the worst patients with the tendons in the ham rigid, (a symptom none of the rest had), were put under a course of sea-water. Of this they drank half a pint every day, and sometimes more or less as it operated, by way of gentle physic. Two others had each two oranges and one lemon given them every day. These they eat with greenness.

liness, at different times, upon an empty stomach. They continued but six days under this course, having consumed the quantity that could be spared. The two remaining patients, took the bigness of a nutmeg three times a-day, of an electuary recommended by an hospital-surgeon, made of garlic, mustard-seed, *rad. raphan.* balsam of *Peru*, and gum myrrh; using for common drink, barley-water well acidulated with tamarinds; by a decoction of which, with the addition of *cremor tartar*, they were gently purged three or four times during the course.

The consequence was, that the most sudden and visible good effects were perceived from the use of the oranges and lemons; one of those who had taken them, being at the end of six days fit for duty. The spots were not indeed at that time quite off his body, nor his gums sound; but without any other medicine, than a gargarism of *elixir vitriol*, he became quite healthy before we came into *Plymouth*, which was on the 16th of *June*. The other was the best recovered of any in his condition; and being now deemed pretty well, was appointed nurse to the rest of the sick.

Next to the oranges, I thought the cyder (*g*) had the best effects. It was indeed not very found, being inclinable to be aigre or pricked. However, those who had taken it, were in
faire

(*g*) *Extract of a letter from Mr Ives.*

I judge it proper to communicate to you, what good effects I have observed in the scurvy, from the use of cyder and sea-water, during the last cruise I made in the western squadron with my honoured benefactor Admiral *Martin*. But as I do not pretend to have taken notice of any thing, more than merely palliative benefit from them, I think, without mentioning particular cases, it will be sufficient for me to inform you, that, in our preceeding cruise with the western squadron, his Majesty's ship *Yarmouth*, of 70 guns and 500 men, was not only troubled with the scurvy in common with other ships, but, in spite of all my endeavours, lost in it a proportioned number of men. Upon our return from that cruise, I took an opportunity to represent to the Admiral, that as vegetable juices of all sorts were from experience found to be the only true antiscorbutics, and I had myself formerly experienced the good effects of apples, it was reasonable to presume that cyder must certainly be of service. This suggestion agreed with some accounts the Admiral had received from others; and he with great readiness bought and put under my care, several hogshheads of the best *South-Hampshire* cyder. During the next cruise, each scorbutic patient had daily a quart or three pints of cyder; and as many of them as could prevail on, took twice a-week three quarters of a pint of sea-water in a morning. In all other respects I treated them as I used to do people in the scurvy; which you well know, from the conversation which has often passed betwixt us on this subject, was with squill vomits, pills composed of soap, squill, garlic, &c. *elixir vitriol*, and other medicines suited to the different stages and symptoms of the malady. In one word we had this cruise as many scorbutic patients as any other ship

fairer way of recovery than the others at the end of the fortnight, which was the length of time all these different courses were continued, except the oranges. The putrefaction of their gums, but especially their lassitude and weakness, were somewhat abated, and their appetite increased by it.

As to the *elixir of vitriol*, I observed that the mouths of those who had used it by way of gargarism, were in a much cleaner and better condition than many of the rest, especially those who used the vinegar; but perceived otherwise no good effects from its internal use upon the other symptoms. I indeed never had a great opinion of the efficacy of this medicine in the scurvy, since our longest cruise in the *Salisbury*, from the 10th of *August* to the 28th *October* 1746; when we had but one scurvy in the ship. The patient was a marine, (one *Walsh*); who, after recovering from a quotidian ague in the latter end of *September*, had ta-

n proportion to our complement of men. But although all the rest buried a great many, some to the number of 20, others 30, 40, 50, and upwards; yet the *Yarmouth* did not bury more than two or three; and these at the latter end of the cruise, all our cyder having been expended for a week or ten days before. Upon our arrival at port, we sent to the hospital a great many in very dreadful circumstances.

ken the *elixir vitriol* by way of restorative for three weeks; and yet at length contracted the disease, while under a course of a medicine recommended for its prevention.

There was no remarkable alteration upon those who took the electuary and tamarind decoction, the sea-water, or vinegar, upon comparing their condition, at the end of the fortnight, with others who had taken nothing but a little lenitive electuary and *cremor tartar*, sometimes, in order to keep their belly open; or a gentle pectoral in the evening, for relief of the breast. Only one of them, while taking the vinegar, fell into a gentle flux at the end of ten days. This I attributed to the genius and course of the disease, rather than to the use of the medicine. As I shall have occasion elsewhere to take notice of the effects of other medicines in this disease, I shall here only observe that the result of all my experiments was, that oranges and lemons were the most effectual remedies for this distemper at sea. I am apt to think oranges preferable to lemons, though perhaps both given together will be found most serviceable.

It may be now proper to confirm the efficacy of these fruits by the experience of others.

Th

The first proof that I shall produce, is borrowed from the learned Dr *Mead* (*b*).

“ One year when that brave Admiral Sir *Charles Wager* commanded our fleet in the *Baltic*, his sailors were terribly afflicted with the scurvy: but he observed, that the *Dutch* ships then in company were much more free from this disease. He could impute this to nothing but their different food, which was stock-fish and gort; whereas ours was salt fish and oat-meal (*i*). He was then come last from the *Mediterranean*, and had at *Leghorn* taken in a great quantity of lemons and oranges. Recollecting, from what he had often heard, how effectual these fruits were in the cure of this distemper, he ordered a chest of each to be brought upon deck, and opened, every day. The men, besides eating what they would, mixed the juice in their beer. It was also their constant diversion to pelt one another with the rinds, so that the deck was always strewed and wet with the fragrant liquor. The

(*b*) Discourse on the scurvy, p. 111.

(*i*) The first is seldom now put on board ships of war, and the last *English* sailors eat but little.

“ happy

“ happy effect was, that he brought his fa-
 “ ors home in good health.”

I have been favoured upon this occasion, by
 different gentlemen, with many instances of
 the like good effects of these fruits in this di-
 ease at sea; particularly by Mr *Francis Ruffe*
 in a cruize performed by the *Princess Carolina*
 off the islands of *Sardinia* and *Corfica*; when
 according to his relation, some of these fruits
 got at *Vado*, preserved great part of the crew
 which otherwise must undoubtedly have per-
 rished.

An ingenious surgeon of great merit and ex-
 perience in the *Guernsey* when extremely dis-
 tressed by the scurvy (*k*), has the following
 observation in his letter upon it. “ I have
 “ great reason to believe, that several lives
 “ were absolutely preserved, when we were
 “ sea, by a lemon squeezed into six or eight
 “ ounces of *Malaga* wine mixed with water
 “ and given twice a-day.”

I am informed, it was principally oranges
 which so speedily and surprisngly recovered
 Lord *Anson's* people at the island of *Tinia*
 Of which that noble, brave, and experien-
 ced commander was so sensible, that, before

(*k*) See the case of that ship, chap. 1. p. 98.

When we left the island, one man was ordered on shore from each mess to lay in a stock of them for their future security.

My ingenious friend Mr *Murray*, who has favoured me with so many useful observations upon this disease; and has had the greatest opportunities of being acquainted with it, as he for a considerable time attended the naval hospital at *Jamaica* whilst our great fleets were in the *West Indies*, and was likewise surgeon of the *Canterbury*, expresses himself thus in his letter. “As to oranges and lemons, I have always found them, when properly and sufficiently used, an infallible cure in every stage and species of the disease, if there was any degree of natural strength but left; and where a diarrhæa, lientery, or dysentery, were not joined to the other scorbutic symptoms. Of which we had a most convincing proof, when we arrived at the *Danish* island of *St Thomas* (1); where fifty patients belonging to the *Canterbury*, and seventy to the *Norwich*, in all the different stages of this distemper, were cured, in little more than twelve days, by limes alone; where

(1) See the former part of this letter, chap. 1. p. 107.

“ little

“ little or no other refreshments could be obtained.”

It was reasonable to ascribe this to the eminent virtues of these fruits; as it is well known and daily experienced, that without such remedies scorbutic people will infallibly die in the purest land-air. But what cures such deplorable cases, must still more powerfully prevent them. Perhaps one history more may suffice to put this out of doubt.

“ In the first voyage made to the *East Indies* (m), on account of the *English East India* company, there were employed four ships, commanded by Captain *James Lancaster* their General, viz. the *Dragon* having ten General and 202 men, the *Hector* 100 men, the *Susan* 82, and the *Ascension* 30. They left *England* about the 18th of *April* in *July* the people were taken ill on the passage with the scurvy; by the 1st of *August*, all the ships, except the General's, were so thin of men, that they had scarce enough to hand the sails; and, upon having a contrary wind for fifteen or sixteen days, the few who were well before, began also to fa

(m) Vid. *Harris's* collection of voyages, and *Purchas's* collection, vol. 1. p. 147.

sick. Whence the want of hands was so great in these ships, that the merchants who were sent to dispose of their cargoes in the *East Indies*, were obliged to take their turn at the helm, and do the sailors duty, till they arrived at *Saldania* (*n*); where the General sent his boats, and went on board himself, to assist the other three ships; who were in so weakly a condition, that they were hardly able to let fall an anchor, nor could they hoist out their boat without his assistance. All this time the General's ship continued pretty healthy. The reason why his crew was in better health than the rest of the ships, was owing to the juice of lemons; of which the General having brought some bottles to sea, he gave to each, as long as it lasted, three spoonfuls every morning fasting. By this he cured many of his men, and preserved the rest: so that although his ship contained double the number of any of the others; yet (through the mercy of God, and to the preservation of the other three ships) he neither had so many men sick, nor lost so many as they did."

(*n*) A bay near the Cape of *Good Hope*.

Here indeed is a remarkable and authentic proof of the great efficacy of juice of lemon against this disease; as large and crowded ships are more afflicted with it, and always in a higher degree, than those that are small and airy. This little squadron lost 105 men by the scurvy. Upon its afterwards breaking out among them when in the *East Indies*, in a council held at sea it was determined, to put directly into some port where they could be supplied with oranges and lemons, as the most effectual and experienced remedies to remove and prevent this dreadful calamity.

I cannot omit upon this occasion observing what caution is at all times necessary in our reasoning on the effects of medicines, even in the way of analogy, which would seem the least liable to error. For some might naturally conclude, that these fruits are but so many acids for which tamarinds, vinegar, *sp. sal. el. vitriol.* and others of the same tribe, would prove excellent *succedaneums*. But, upon bringing them to the test of experience, we find the contrary. Few ships have ever been in want of vinegar, and, for many years before the end of the late war, all were supplied sufficiently with *vitriol*. Notwithstanding which, the *Chann*
flee

fleet often put on shore a thousand men miserably over-run with this disease, besides some hundreds who died in their cruises. Upon those occasions tar-water, salt water, vinegar, and *el. vitriol* especially, with many other things, have been abundantly tried to no purpose: whereas there is not an instance of a ship's crew being ever afflicted with this disease, where the before mentioned fruits were properly, duly, and in sufficient quantity, administered.

I elsewhere observed the uncertainty of such theories as are founded upon the chemical principles of acid and alcali (*o*): for although acids agree in certain properties; yet they differ widely in others, and especially in their effects upon the human body. Of theory in physic the same may perhaps be said, as has been observed by some of zeal in religion, That it is indeed absolutely necessary; yet, by carrying it too far, it may be doubted whether it has done more good or hurt in the world.

Some will perhaps say, that these fruits have been often used in the scurvy without success; as appears from the experience of physicians, who prescribe them every day in that disease at land. And here we may again ob-

(*o*) Part 1. chap. 2.

serve the fatal consequence of confounding the malady with others. Legions of distempers (according to *Willis* and others) very different from the real and genuine scurvy, have been classed under its name: and because the most approved antiscorbutics fail to remove such diseases, hence we are told by authors (*p*), that it is the masterpiece of art to cure it. But this is contradicted by the daily experience of seamen, by the journals of our sea-hospitals, and by the yearly experience of our *English East India* ships at *St Helena*, and the Cape of *Good Hope*. So that nothing can be more absurd than to object against the efficacy of the fruits in preventing and curing the real scurvy because they do not cure very different diseases.

Some new preservative might here have been recommended; several indeed might have been proposed, and with great shew of the probability of their success; and their novelty might have procured them a favourable reception in the world. But these fruits have this peculiar advantage above any thing that can be proposed for trial, that their experienced virtu-

(*p*) *Boerhaave*, and many others.

have stood the test of near 200 years. They were providentially discovered, even before the disease was well known, or at least had been described by physicians. *Ronssjeus*, the first writer on this subject, mentions them (*q*); and observes, that in all probability the *Dutch* sailors had by accident fallen upon this remedy, when afflicted with the scurvy, in their return from *Spain* loaded with these fruits, especially oranges. Experience soon taught them, that by thus eating part of their cargo, they might be restored to health. And if people had been less assiduous in finding out new remedies, and trusted more to the efficacy of these fruits, for preventing this fatal pestilence to seamen, the lives of many thousand sailors, and others (*r*), (especially during the last war),
 might

(*q*) Epist. 2.

(*r*) Vid. *Kramer's* observations, part 3. chap. 2. the best ever made on this disease; which abundantly confirm all that is here advanced. In a book published afterwards he makes the following remarks. The scurvy is the most loathsome disease in nature; for which no cure is to be found in your medicine-chest, or not in the best-furnished apothecary's shop. Pharmacy gives no relief, surgery as little. Beware of bleeding; shun mercury as poison: you may rub the gums, you may grease the rigid tendons in the ham, to little purpose. But if you can get green vegetables; if you can prepare a sufficient quantity of the fresh noble
 antiscorbutic

might in all probability have been preserved. But some have been misled to recommend many other things, as of equal, if not superior antiscorbutic qualities to these; and have reduced them to a level with other acids, and many falsely supposed antiscorbutic medicines: from whence the many unhappy disappointments hitherto met with in preventing this disease at sea seem to have arisen.

We are told, that at the siege of *Thorn* when this calamity raged with great violence in the town, it was the last and most earnest petition of the diseased, that some of these fruits might be permitted to enter their gates, as the only hopes of life, and last comfort of the dying patient (*f*). In this disease, when drugs of all sorts are nauseated and abhorred, the very sight of these fruits raises the drooping spirits of the almost expiring patient. I have often observed, (upon seeing scorbutic people landed at our naval hospitals), that the eating of them was attended with a pleasure easier

antiscorbutic juices; if you have oranges, lemons, or citrons; or their pulp and juice preserved with sugar in casks, so that you can make a lemonade, or rather give to the quantity of three or four ounces of their juice in whey, you will, without other assistance, cure this dreadful evil. *Krameri medicina castrensis.*

(*f*) *Bachstrom observ. circa scorbutum, p. 15.*

be imagined than to be described. Hence Lord *Delarwar*, a very great sufferer in this malady, (in the relation of his case to the Lords and others of the council of *Virginia*), very pathetically expresses himself thus. "Heaven has kindly provided these fruits as a specific for the most terrible of evils (*t*)."

As oranges and lemons are liable to spoil, and cannot be procured at every port, nor at all seasons in equal plenty; and it may be inconvenient to take on board such large quantities as are necessary in ships for their preservation from this and other diseases; the next thing to be proposed, is the method of preserving their virtues entire for years in a convenient and small bulk. It is done in the following easy manner.

Let the squeezed juice of these fruits be well cleared from the pulp, and depurated by standing for some time; then poured off from the gross sediment: or, to have it still purer, it may be filtrated. Let it then be put into any clean open earthen vessel, well glazed; which should be wider at the top than bottom, so that there may be the largest surface above to favour the evaporation. For this purpose a china basin

(*t*) *Purchas*, vol. 4. p. 16.

or punch-bowl is proper; or a common earthen bason used for washing, if well glazed, will be sufficient, as it is generally made in the form required. Into this pour the purified juice; and put it into a pan of water, upon a clear fire. Let the water come almost to boil, and continue nearly in a state of boiling (with the bason containing the juice in the middle of the fire) for several hours, until the juice is found to be of the consistence of oil when warm, or of a syrup when cold. It is then to be corked in a bottle for use. Two dozen of good oranges, weighing five pounds four ounces, will yeild one pound nine ounces and a half of purified juice; and when evaporated, there will remain about five ounces of the extract; which in bulk will be equal to less than three ounces of water. So that thus the acid, and virtues of twelve dozen of lemons or oranges, may be put into a quart-bottle, and preserved for several years.

I have some of the extract of lemons now by me, which was made four years ago. And when this is mixed with water, or made into punch, few are able to distinguish it from the fresh squeezed juice mixed up in like manner; except when both are present, and the

differ

fferent tastes compared at the same time; when the fresh fruits discover a greater degree of smartness and fragrancy.

The learned Dr *Mead* ascribes some salutary effects to the fragrancy of the fresh fruits, when he observes, that by the sailors pelting each other with the rinds in Admiral *Wager's* ship, the decks were strewed and wet with this wholesome liquor. Was any thing to be expected from perfuming the air with the fragrancy of these fruits, it is easily done at any time by a few drops of their essence, or the aromatic oil contained in the rinds. An addition of a small quantity of this to the extract, will give it the smell and fragrancy of the fresh fruit in great perfection. And if it is also required to be taken inwardly, a few drops of it upon sugar may be given along with the extract. But perhaps so hot an oil may rather prove prejudicial. It is the saponaceous juice alone, of these fruits, that is here requisite; and their entire salutary virtues may be obtained by taking that inwardly; as appears plainly by the relation of Captain *Lancaster's* voyage, where the juice of lemons kept in bottles, not only prevented the disease, but cured it, at sea. This juice must either have been mixed up with spi-

rits, or something else, to preserve it (*u*); and consequently differed much more in quality from the fresh fruit than what is proposed.

However, if it be judged of any consequence to preserve the perfect fragrancy of the fruit, I have found, upon experiment, that there are several other ways of doing it. They who intend this extract for acidulating punch, may infuse some of the fresh peel of the oranges or lemon in the spirit before it is used. I have known some who distil brandy themselves from their spoiled wines, throw these peels into the still. Either of the methods makes a most agreeable and fragrant punch with the extract. The essential oil of the rind is thus so subtilised, and incorporated with the spirit, as to be itself converted as it were into a purer spirit. And will not then have the heating quality, nor affect the head afterwards so much as the simple oil may do. The water of these peels drawn in a cold still, keeps a considerable time in a separate bottle from the extract; and when mixed with it at using, restores the perfect fragrancy of these fruits as when fresh.

(*u*) The lime-juice brought home from the *West Indies*, commonly either mixed with rum, or covered a-top with oil notwithstanding which, it generally turns musty.

But, for this purpose, I find it is sufficient to add a very small quantity of the outer peel to the extract a little before it is taken off the fire, and there will be all that is requisite to make it entirely equal to the freshest fruit; in so much that the nicest taste will not be able to distinguish any difference. Its virtues (as must appear to any one so far conversant in chemical principles, as to know there is nothing more lost here than water, with a scarce perceptible acid) will be found nothing inferior to the fresh fruit (*x*).

In this manner prepared, it must be kept in bottles, where it will remain good for several years. When made in a proper place and season, it will come very cheap; and our navy may be supplied with it at a much easier rate than any thing as yet proposed. It will be found extremely wholesome on all occasions, but especially to correct bad brandy, and other noxious spirits, often drank by sailors in immoderate quantity. Rum in the *West Indies*, ar-

(*x*) This I think cannot be doubted by any person who has tasted it, or who will take the pains to make proper comparisons and trials with it, and the freshest orange or lemon juice. Indeed the benefit presumed to be derived from the flavour is so small, that the plain extract is quite sufficient. Officers, by putting in a little of the candied peel in their punch, will give it the agreeable flavour wanted.

rack or brandy, when served them by way allowance, should always be first mixed up with the extract. This will not only make them more palatable, but, what is a matter of much great moment, will convert these poisonous pernicious draughts into a sovereign remedy, and a preservative against a scorbutic habit, the bane of seafaring people.

I shall add one observation in its favour. The island of *Jamaica* is much less liable to this sickness at present than formerly. Our fleets in the *West Indies* in the beginning of the war were much more sickly than in the latter end of it, when indeed they were surprisngly healthy. This, with great reason, has been universally ascribed to the drinking a great quantity of this acid, by making their punch so strong and weak.

I proceed to some farther directions given for the information of commanders of ships, and those who have proper conveniencies on board, who may relieve the sick, upon occasion, with their stores. And it may be proper to acquaint them, that most berries, and several fruits, when gathered two thirds ripe on a dry day, while the sun shines, if put into earthen pots, or rather in dry bottles, well corked, and sealed up,

th

That no air or moisture can enter, will keep a long time, and, at the end of a year, be as fresh as when new pulled. These the captains may supply themselves with at every port in *England*, from the pastry-cooks shops, with proper directions for their preservation. Green gooseberries will keep for years, if, after being put into dry bottles, their moisture is exhaled, by putting the bottles slightly corked into a pot of water, which is allowed to come nearly to boil, and continue so for a little; when a very small quantity of juice yielded by them is to be thrown away, and they are afterwards kept close stopt. These would prove a sovereign remedy for the sick: and, by such methods, ships in long voyages, when touching at any place for water and provisions, may likewise lay up a sea-store of berries and fruits.

Various wholesome herbs and roots may likewise be preserved at sea, according to the different directions given for that purpose in books of confectionery; such as small onions in a pickle of vinegar, &c. Most green vegetables, as cabbage, *French* beans, and others, are preserved, if put when very dry in clean dry stone-jars, with a layer of salt at bottom; then a thin layer of the vegetable covered with salt,
and

and so alternately, till the jar is full; when the whole is to be covered with salt, and well pressed down with a weight, and its mouth close stopt, that no air or moisture may enter. In using, the salt is to be washed off by warm water; when the vegetable, after keeping a year, will be found fresh and green. I have been told, that in this manner that sovereign never-failing remedy, the *Greenland scurvy-grass* (y), may be preserved, and that pots of it have been brought over quite fresh and green.

Every common sailor ought to lay in a stock of onions. I never observed any that used them fall into the scurvy at sea. When their stock is exhausted, the captains may have recourse to their pickled small onions; and with fowls, mutton, or portable soup, and the pickled cabbage before mentioned, of which the *Dutch* (z) sell great quantities, they will be able to

(y) Vid. Mr *Maude's* letter concerning it, chap. 5.; also, the extraordinary case of a sailor related by *Bachstrom*.

(z) The *Dutch* sailors are much less liable to the scurvy than the *English*, owing to this pickled vegetable carried to sea. Vid. *Krameri epistolam de scorbuto*. A mess of this given twice a week boiled in their peas, seems all the addition requisite to be made to the present victualling of the navy for the effectual prevention of the scurvy. It may be objected, That its saltness would rather prove hurtful in this disease. But this objection is found

able to make a broth at sea, almost the same with what is used in our naval hospitals for recovery of scorbutic people. I have known several

upon a very false opinion, that sea-salt breeds the scurvy: the contrary of which has been fully demonstrated chap. 1. and confirmed by numberless instances of giving salt water in very bad scurvies, both at sea and land, with great benefit to the patient. See Mr *Ives's* letter, p. 194. Dr *Grainger's*, chap. 5.

The fact here truly is, that vegetables preserved in this manner, so far from being salt after duly washing them in warm water, require to be eat with salt: they are thus preserved quite succulent and green. Their virtue is the same as if taken fresh out of the garden, and the method infinitely superior to the drying of them, as was proposed, like hay; which would entirely destroy their antiscorbutic quality; as will be made appear when we come to inquire (chap. 6.) into the properties and virtues peculiar to green succulent vegetables, so essentially requisite for the prevention, and in the cure of this malady. To the surgeon's necessaries in long and sickly voyages, it would not be amiss to add some boxes of portable soup; and at all times some pots of preserved small onions. It is demonstrable from the most incontestable experience, that a soup of boiled cabbage and onions will cure an adventitious scurvy in its first stage, either at sea or land, in any part of the world. By a like soup, with addition of fresh flesh-meat, seventy people were perfectly cured in the *Guernsey* (see p. 98.), without one of them setting foot on shore. This was not owing to the flesh in their soup, but to the vegetables: for I have known some favourites of the Captain's who had fresh mutton-soup given them almost every day, without the least benefit, until they arrived at port; where they were cured in a few days by the same soup, with addition of vegetables. And that vegetables have the same effect at sea as at land, is plain from Mr *Ives's* journal (see p. 144. & 145.), where the people continued to recover at sea from the 29th

November

veral captains, who, by carrying out boxes filled with earth, which stood in their quarter galleries, were supplied with wholesome salad

November that they left *Vado*, until the 25th *December*, by means of fruits given them.

A gentleman on board the *Commodore* at that time told me that the whole squadron was greatly distressed with the scurvy and in particular the *Commodore's* ship; in so much, that, after having used all means, to no purpose, that could be thought of to put a stop to the malady, he was at last obliged, for the preservation of his people, to stretch over to the coast of *Italy* and leave his station for a while. At this time many were extremely bad. Upon his arrival at *Vado*, he found the whole country covered with snow; and such was the severity of the winter, that there was hardly any kind of greens to be got for the relief of his distressed crew. Upon which this excellent commander (now *Adm. Osborn*) very wisely directed his people to buy up all the oranges and lemons in the town. His boats brought on board a considerable quantity of them. He likewise supplied his squadron with some fresh beef. Being obliged to make but a very short continuance at *Vado*, he directly returned to his station with a store of these fruits, but with his men still in a bad condition. He continued cruising at sea for three weeks, in very rough weather. Notwithstanding which, by means of these fruits, many who were very bad, and all who were in the first stage of the disease, were perfectly recovered while at sea, and the lives of the whole crew preserved.

N. B. This relation given me by *Mr Ruffel* (see p. 198.) does not entirely agree with *Mr Ives's* as to the fruits got at *Vado*. It seems different ships got different fruits. However there must be many people who are well acquainted with those facts, as it was a considerable squadron, consisting of very large and capital ships.

afte

After being some months out of harbour. A
 ask of rich garden-mould put occasionally in
 boxes on the poop, and sown with the seed of
 garden-creffes, would furnish these at any time.
 Such seeds will likewise grow in wet cotton.

Besides fresh and preserved fruits and vegeta-
 bles, fermented liquors of all sorts are found
 beneficial in this disease. Some of them how-
 ever are more antiscorbutic than others. By my
 own experience, I found cyder the best of any
 I have had occasion to try. And it would seem
 an excellent method of preserving other vege-
 table juices, (gooseberries, blackberries, cur-
 rants, elderberries, or even *Seville* oranges),
 to ferment them into made wines or beer.
 These I am persuaded will be found preferable
 to many medicated antiscorbutic ales and wines
 by infusion, that might here be recommended.

It is pretty remarkable, that the first north-
 ern colonies in *America* were extremely subject
 to this disease. The *French* especially, upon
 their first planting *Canada* and *New-France*,
 suffered so much by the mortality it occasioned
 in the winter-season, that they had often
 thoughts of abandoning their settlements; e-
 ven the natives were not exempted from the

E e

ravage

ravage of this cruel evil (*a*): whereas not on these colonies, but others in a colder and more northern situation, are at present quite healthy. One would be apt to ascribe this, to the many hardships and inconveniencies infant-colonies are necessarily exposed to; were it not, that we see many poor people wintering yearly in *Newfoundland*, where this disease was formerly so fatal, who from poverty suffer equal, if not greater hardships, than the first planters during the severity of winter. They are, for almost eight months in the year, destitute of fresh vegetables, and live entirely on salt and dried fish, coarse bread, and much worse fare than a ship's provisions. Their air is likewise grosser, colder, and moister, than is commonly the case at sea. Notwithstanding which, they keep perfectly free from the scurvy. And this is ascribed to their common drink, which is spruce beer.

It is indeed matter of surprise, and was not taken notice of before as the most convincing proof that this calamity may be prevented anywhere, that the people who reside at our factories in *Hudson's bay*, are so very healthy. Where, according to *Ellis's* account, they sometimes do not bury one man in seven years or

(*a*) See part 3. chap. 1.

of a hundred that are in their four factories (*b*): whereas the first adventurers to that part of the world, who wintered in the same places, were almost all destroyed by the scurvy, viz. Capt. Monck's people in 1619 (*c*), Capt. Thomas James's at Charleton island in 1631 (*d*), and most others who attempted it. A set of sailors, consisting of seven men, was left two winters successively, in the years 1633 and 1634, at Greenland and Spitzbergen, by way of experiment: but every man of them next spring was found to have died of the scurvy (*e*). The unhappy fate of those people, who all perished in this great misery, and left behind them a journal of their piteous misfortunes, seems to have been owing to the world's ignorance of the distemper at that time, and the pernicious methods recommended to them for preservation; which we find were chiefly purging antiscorbutic potions, distilled spirits, viz. brandy, and the like; all which infallibly increased the malady, and hastened their unhappy end.

From these unsuccessful trials it was judged

(*b*) See voyage to Hudson's bay.

(*c*) Churchill's collection of voyages, vol. 1. p. 541.

(*d*) Harris's collection of voyages, vol. 2. p. 406.

(*e*) Churchill's collection, vol. 2. p. 347.

impracticable to pass the winter in those parts. But the following accident afforded the most convincing evidence of this mistake. A boat crew, consisting of eight men, was by chance left behind, and obliged to winter in almost the same place (*f*). The season proved equally rigorous and severe. The poor fellows had nothing to trust to for sustenance but what their guns procured. Thus luckily were every one of them preserved alive, by being unprovided with what might have been deemed necessary (though in effect pernicious) means of subsistence and preservation. They had no brandy, no coarse hard biscuit, nor salt flesh meats, &c.

But what deserves particular consideration is, that those who live on the coarsest food with a salt diet, and use spruce beer at the same time, are seldom or never afflicted in the coldest and most northern countries. It was observed in *Holland*, that when the custom of drinking wine more freely was practised, this distemper became less frequent (*g*). And among the first cures recommended to the world was wine, with wormwood infused in it (*h*).

(*f*) *Churchill*, vol. 4. p. 745.

(*g*) *Bruneri tract. de scorbuto.*

(*h*) See part 3. chap. 1. *Olaus Magnus.*

which was afterwards long used by way of prevention in *Saxony*, where this evil was peculiarly endemic (*i*). Fermented vinous liquors of any kind are indeed very beneficial. But it appears by the experience of the northern *American* colonies, as also of several countries up the *Baltic* in *Europe*, &c. that genuine *bock beer* is, above all others, not only an effectual preservative against it, but an excellent remedy.

The antiscorbutic virtue of the fir was, like many other of our best medicines, accidentally discovered in *Europe* (*k*). When the *Swedes* carried on a war against the *Muscovites*, almost all the soldiers of their army were destroyed by the true marsh or marine scurvy, having rotten gums, rigid tendons, &c. But a stop was put to the progress of this disease, by advice of *Erbenius* the King's physician, with a simple decoction of fir-tops; by which the most deplorable cases were perfectly recovered, and the rest of the soldiers prevented from falling into it. It also proved

(*i*) See part 3. chap. 2.

(*k*) *Vid. Moellenbroek de arthritide vaga scorbutica*, p. 116. *Et Mulleri opera*, p. 2. said by some to have occurred in the army of *Wladislaus* King of *Poland*.

an excellent gargle for the putrid gums. From thence this medicine came into great reputation, and the common fir, *picea major*, or *abrubra*, was afterwards called *pinus antiscorbutica*. *Pinus sylvestris*, the mountain-pine has likewise been found highly antiscorbutic.

I am inclined to believe, from the description given by *Cartier* of the *amedá* tree, with a decoction of the bark and leaves of which his crew was so speedily recovered, that it was the large swampy *American* spruce tree (1). For although the pines and firs, of which there is great variety, differ from each other in the size and outward form, the length and disposition of their leaves, hardness of wood, &c. yet they seem all to have analogous medicinal virtues, and great efficacy in this disease. The shrub spruce, of that sort vulgarly called the *black*, which makes this most wholesome drink, affords a balsam superior to most turpentine, though known only to a few physicians.

A simple decoction of the tops, cones, leaves, or even bark and wood of these trees, is an

(1) See part 3. chap 1. *Hackluit's* collection of voyages vol. 3. p. 225. Some have believed it to be the *fassafras*, others the white thorn; but, in his third voyage, he mentions the white thorn, and makes the *amedá* to be three fathoms circumference.

orbatic: but it becomes much more so when fermented, as in making spruce beer; where the *molasses* contributes, by its diaphoretic quality, to make it a more suitable medicine. By carrying a few bags of spruce to sea, this wholesome drink may be prepared at any time. But where it cannot be had, the common fir-tops used for fuel in the ship, should be first boiled in water, and the decoction afterwards fermented with *molasses*, in the common method of making spruce beer; which will be found the most efficacious antiscorbutic perhaps of any fermented liquor, as being of a diuretic and diaphoretic quality. In extremity tar-water may be tried, fermented in like manner; by which it will certainly become much more antiscorbutic.

We come now to observe what treatment is proper for convalescents, or those who are recovering from tedious fits of sickness, by which they have been greatly exhausted and weakened. Here the prevention of the scurvy will depend much upon two articles, *viz.* a proper diet, and exercise. The former must be adapted to the weakness of their digestive powers, and the sharp and acrimonious condition of the blood and juices. The latter must be suited to
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the debilitated state of their body. We find that when people in this condition at land, and much more so in the moist sea-air, are put directly upon a gross viscid diet, they are very apt to become scorbutic. For these, in the first place, we would recommend an allowance of flour instead of salt beef and pork; and (sea-biscuit being too gross food for them) this must be well leavened, and baked into fresh bread, instead of being cooked into puddings and dumplings, as is common; which will be found an excellent antiscorbutic; and is, together with vegetables, eagerly longed for by scorbutic persons. It may appear a direction not easily to be complied with, to people unacquainted with sea-conveniencies. But many ships, especially all ships of war, have an oven, and it is a practice with most captains, to have their own bread baked twice or thrice a-week while at sea. When the patient is extremely weak, a little of this fresh bread should be boiled in water, and made into panada; adding a few drops of the juice or extract of lemon, and a spoonful of wine.

The other parts of diet should be oat-meal and rice gruels, flumery, roasted or stewed apples, if they can be got, stewed barley, with raisins

isins or currants, sago and wine, &c. but particularly the pickled green cabbage, and small onions, boiled with the portable soup made weak. Most food and drink ought to be acidulated with the orange or lemon ice; which at such times proves highly grateful, both to the palate and stomach of the patient; who by degrees, as his appetite, but especially as his strength increases, is to be indulged with more solid food: though he would do well to abstain for some time from all animal substances, and take no other reparative but wine, with the proper vegetable and lightest farinaceous substances. A caution is here requisite, that to the convalescents nourishment should be given often, but in a small quantity at a time, so as not to oppress the organs of digestion.

It is likewise a matter of great importance, that the body weakened by preceeding sickness, be by degrees habituated to exercise. Nothing can be more inhumane, than to oblige a poor weak man to undergo more fatigue than his strength can bear; nor any thing more prejudicial to his recovery, than, under the notion of preserving him from the scurvy, to force him too soon to do the ship's duty. On the other

hand, a total neglect of exercise is peculiarly productive of this disease. The rule then is to proportion the continuance and degree of it to the strength and condition of the patients to begin with the most gentle and easy at first and proceed gradually to the more violent as they acquire strength. Thus, after being accustomed to sit up some hours through the day in bed, they are then to be allowed to get out of it, and continue so, as long as the strength, without great weariness or fatigue will permit. They may next be put into a sling hung below the fore-castle, or betwixt decks; which will affect them not only by causing a change of air, but at the same time give spirits and refreshment. They will afterwards be able to bear riding on a cross deal laid betwixt two chests, where the successive concussions of the body will be more sensibly perceived. And it is to be remarked, that as weak persons at land generally find the greatest benefit from exercise in a coach, chaise, or on horse back; so the convalescents in a ship, especially scorbutical people, will receive much more advantage from this exercise, than from walking or running, or any kind of muscular motion in which

which

which a great exertion of strength is required. The reason seems to be, because these latter are attended with a waste and dissipation of spirits; and are generally followed with weariness and fatigue: whereas, by the frequent succeeding vibrations of a jolting machine, the circulation is promoted, the fibres of the body strengthened, and the weakened animal functions invigorated, without any considerable loss of spirits, which such people cannot well bear.

These and the like exercises are absolutely necessary to prevent the scurvy in those who have hurts, sprained joints, ulcers on their legs, and other ailments, which confine them below, and disable them from walking; in which case they soon become scorbutic, when living on the gross sea-diet.

Others upon recovery may, at the same time they practise these exercises, be made to walk a little upon deck, so as not to over-fatigue themselves; and afterwards be put upon such duties as their condition will permit them to perform: having recourse, if needful, to *elixir vitriol*, bitters, the bark, or steel, according as they may be requisite to perfect their strength and recovery. To which, however, nothing will contribute so much, and at the same time more

effectually prevent the scurvy, than bodily exercise; which will be found to agree best with them when the stomach is not full, or rather just before meals. It is observed, that when scorbutic people use no exercise, the disease advances very fast upon them at sea: therefore if they can bear only the most gentle motions these are often to be practised; and the body is not to be permitted continually to rest, without some sort of action. When confined to bed, frictions may be used upon their limbs and body. Let it however be remembered that too violent exercise is as dangerous and pernicious in this disease as too little.

I proceed now to point out the means correcting or removing many inconveniences which occur at sea, especially those which are observed to be productive of this malady. The most powerful and principal cause of which (*m*) and indeed of many others at sea, is the moisture of the air, and consequently the dampness of their lodging; especially during a long continuance of thick close weather, or a stormy and rainy season. As this is found to be the most frequent cause of this fatal disease, whose effects are rendered still more pernicious when

(*m*) See Part 2. chap. 1.

combined with cold ; these require in a particular manner to be guarded against. And they are either immediately to be corrected, or their effects and consequences prevented.

As to the first: Although we cannot at once remove a person into another climate, or into the land-air ; yet we can easily give to the air he breathes, a more salutary quality, by rendering it at any time warmer or colder, moister or drier, as the exigency of the case and circumstances may require. I observed elsewhere (*n*), that the noxious qualities of the moist air at sea were greatly heightened by being confined in so close a place as a ship, without a succession, or fresh supply of it. But as that inconvenience is sufficiently guarded against by the excellent invention of *Sutton's* machine, which extracts all such foul and putrid air, and thus will prevent many infectious malignant fevers caused from thence ; so there seems nothing wanting to make it likewise an excellent preservative against the scurvy, but that it should correct the moisture of the sea-air, and dry or warm it betwixt decks when needful.

This I conjecture it might be made to do by

(*n*) Part 2. chap. 1. p. 114.

some

some additional contrivances, which may invert its operation; that is, instead of drawing up the air from below, the air warmed by the fire in the galley or fire-place, may be forced betwixt decks through its pipes when requisite. I mention it only (for experiment alone must make this improvement, and with such caution as to prevent detriment by it) to induce something of this kind to be thought of by proper judges. If the additional machinery were but small, and not incommodious in the ship, the advantages derived from it would be very great. These are evident from what has been said in discoursing on the cause of the scurvy (*o*). It must prove highly serviceable in cold climates, and in northern voyages in the winter, (where the sailors not only become terribly scorbutic, but are often chilled to death with the cold, and at other times have their limbs mortified), if, by a simple contrivance of this sort, the fire used for dressing their victuals, could be made to warm them even when in bed.

Fire made with any of the aromatic woods or even with common fir or pine, juniper, and the like, effectually corrects this disposition of

(*o*) Chap. 1.

the air, and at the same time renders it more salutary in other respects. It is observable, that betwixt the tropics, the rainy seasons prove the most unhealthy and dangerous, not only on land, but in ships; giving rise to malignant fevers, scurvies, &c. In this case, without any inconvenience or danger, a clear open fire, properly secured, might be lighted betwixt decks, to stand upon the hatchways in a stove; which would greatly purify the air, and destroy its hurtful moisture, without much increasing the heat, if burnt in an open hatchway. There is certainly less danger, nay less heat, attending a fire burning for an hour or two in the day here, guarded by a centinel, than having fifty or sixty candles lighted in an evening; or burning them constantly night and day in the orlope, and other dark places: whence such parts of the ship are continually replete with the nauseous effluvia of rank corrupted tallow. It would seem indeed no difficult matter, to convert even these into medicinal preservatives against the scurvy, and other putrid diseases from bad moist air, by the addition of some proper aromatic in their composition. The burning of spirits will be of service in the sick-apartment. The captains, or those who can afford

ford them, will find the myrtle wax candle the best for use in a moist sea-air.

Next to be considered, are the best means of preventing the effects and ill consequences of such air, when not corrected by the methods proposed.

Fire, as before observed, is the most certain consumer and drier of humidity. We moreover find, that the exhalations of aromatics, though properly speaking, they do not dry up moisture yet prevent the pernicious effects of it upon the human body, by diffusing through the air a subtile acid, of an antiseptic and astringent quality, opposite to the putrid and relaxing tendency of moisture. Thus we often observe many asthmatic persons greatly affected with moist wind, and in a damp season hardly able to breathe; but upon throwing a little benzoin or the like aromatic gum, on a red-hot iron by which their chamber is well perfumed, and the air replete with these aromatic particles they are sensible of relief, and breathe much more freely. So here I would recommend the most simple and easy operation, to be performed in such damp seasons in a ship; which is putting a red-hot loggerhead in a bucket of tar, which should be moved about, so that a

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the ship, once or twice a-day, may be filled with this wholesome antiseptic vapour.

Persons for proper security, during a scorbutic and moist constitution of air, should go well cloathed, and shift often with dry linen. Cleanliness and cleanliness of body are excellent preservatives against this malady. They should use the flesh-brush, or frictions with a dry cloth on their skin; eat a bit of raw onion, or a head of garlic, in a morning before they are exposed to the rains and washings of the sea. Whatever promotes perspiration is useful; and perhaps nothing will do it more effectually at this time than a raw onion. Nor ought these farther precautions to be omitted, of using proper exercise in the day, and having their bedding kept always dry, not binding it up close together till sufficiently aired and dried.

When they are threatened with the approach of this disease, they ought, at going to bed, to promote a gentle *diaphoresis*, by draughts of water-gruel and vinegar, with the addition of lemon-juice, or the extract. They should use plenty of mustard and onions with their meals; and may then indulge more freely in the use of fermented vinous liquors, *viz.* cyder, beer, and wine: but when of necessity

obliged to drink spirits, they ought always to acidulate them with the acid of orange or lemons. These directions will preserve seamen not only from the scurvy, but from many other diseases, as coughs, catarrhs, &c. arising from an obstructed perspiration in moist air.

The water and provisions being often in such an unsound and corrupt condition, and may be supposed to increase the virulence of this evil, it will not be improper to add some considerations for preventing and remedying these inconveniencies.

Water is with difficulty preserved sweet at sea (*p*); and sometimes cannot even be procured wholesome at places where ships may touch. There are two sorts of bad water. The first is, putrid and stinking; the other, a hard heavy water that is not putrid, but which will not incorporate with soap, or break peas when boiled in it. Both are very unwholesome.

Water at sea will sooner or later putrify, according to its various contents, and the mar-

(*p*) See the manner of preserving water good and wholesome at sea by quick-lime, part 3. chap 2.; also, Dr Hales's curious philosophical experiments, and his directions to preserve water and provisions at sea.

ner in which it is kept. It has been experienced, that, by fuming the casks with burning brimstone, water will keep longer sweet. Some add a little oil of vitriol to it; which likewise preserves it a longer time from putrifying. It is a common practice, and a very good one, to throw a little salt into water while warming; and as it grows hot, there will arise a thick feculent unwholsome scum, which is carefully to be taken off as it casts up. And this should always be done in boiling peas and oat-meal.

When the water is become putrid and stinking, one manner of sweetening it is, by taking out the bungs of the casks, exposing it to the air, and shaking, and pouring it from one vessel into another. Another way is, by letting it quickly come to boil; taking care not to boil it too long, which would expel the most active parts of the water. This will still be rendered sweeter, and more wholsome, when a little of the juice or extract of lemons is added to it; which is much safer for common use, than the mineral acids of *vitriol*, or salt, ordered by some on this occasion. The acid will likewise contribute to precipitate the earthy particles of the water, and the various *animalcula*

with their sloughs, now destroyed by the boiling.

But as this may be found troublesome to do for a whole ship's company, there is another method of sweetening putrid water. Sometimes, as is observed by my learned friend Dr *Home* (*q*), by keeping such water close and warm in a large vessel, it will become fit for use when the process of putrefaction is once over; by which the noxious and putrescent particles having been made quite volatile, will fly off of themselves; as is often the case of the *Thames* water. A large cask of stinking water closely bunged up, should be put into the gallery, and kept in a degree of warmth sufficient to promote this process of putrefaction: the effect of which will be, that the heterogeneous putrescent particles rendered thus volatile, will all quickly escape; and the putrefaction by this means being stopt, the water becomes wholesome, and fit for use.

Besides this putrid water, sailors are often obliged to use, for want of better, a hard water, as it is called, replete with foreign, saline and terrestrial particles; which is found to be very unwholesome, though fresh and sweet.

(*q*) In his ingenious essay on the *Dunse* Spaw, p. 119.

To make this wholesome and salutary, the one filtre used on board several ships is very proper, where the water does not abound with nitriolic or marine salts. But its operation is tedious, and it can never pass a sufficient quantity for the use of a ship's company. Sand is the fittest body for separating these heterogeneous and unwholsome particles from water. Upon this occasion, I must again refer to the ingenious essay on the *Dunse Spaw* (*r*).

(*r*) P. 120. The *Austrian* army, when incamped in *Hungary*, and no good water, unless when on the banks of some great river. So, when obliged to use lake-water, they purify it in this manner. A long small boat is divided into several different apartments by cross partitions. They fill them all, except the last, with sand. The boat is put into the lake. A hole level with the surface of the water is made in the end of the boat, which lets the water into the first division; from this it gets into the second, by a hole made in the bottom of the first partition; from the second it runs into the third, through a hole in the top of the second partition; and so alternately above and below, that it may be obliged to pass through all the sand. At the top of the last division there is a pipe, through which the water comes, at pleasure, as pure as from a fine spring. And thus seamen when abroad meeting with such water, may purify even the hardest kind of it. And for the same purpose in a house he proposes some casks divided in the middle, and filled with sand; into the first of these divisions the water may be thrown as into a cistern; the casks ought here to be joined by pipes; and by making it thus circulate through eight or ten divisions filled with sand to the top, a pure spring may be had any where.

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When the provisions of beef and pork are putrid and rancid, it will be most advisable not to eat of them; or at least to correct their bad qualities, by using at the same time plenty of vinegar, oranges, lemons, and vegetables. I am afraid any method that might be proposed to sweeten putrid flesh, will be found not easy to be put in execution at sea.

There are several ways generally known of recovering spoiled beer, wines, and other fermented liquors; and as these liquors are all of them antiscorbutic, they are well worth preserving. Yeast should be carried to sea for this and other purposes. When it has grown stale by keeping, a little flour, sugar, salt, and warm beer, are to be mixed with it; or even hot water and sugar only. By adding to it the grounds of strong beer, and letting the mixture stand a little before the fire, it will serve either to work beer, or bake bread. In case there is no yeast on board, honey, sugar, leaven, or molosses, may be used to renew the fermentation of liquors.

The dry provisions, oat-meal, peas, and flour, are apt to be corrupted and spoiled by weevils, maggots, and by growing damp and mouldy. These destructive vermine may be
killed

killed by the fumes of brimstone in a close place. But even then the weevils, when eaten, are found to be very unwholesome, and are said to have such a caustic quality, as, when applied to the skin in the form of a poultis, to raise blisters like the *cantharides*. When no better provisions can be procured, the flour, oat-meal, or peas, should be put in a heap, and then these vermine will come to the top of it; so that a great number of them may be taken away, and sifted out with the dust. The parcel is to be stirred and heaped again, until as many of them as possible are removed. The groats and peas may be turned over into a wire-sieve, which will let the dust and weevils pass through it.

Sound good bread is a most important article at sea. The biscuit, when mouldy and spoiled, should be put into a warm oven, or under the fire-place, till the putrid moisture is quite exhaled, and the *animalcula* destroyed. These are afterwards to be well beat out of it, and then it may be eat dipt in vinegar. Close casks preserve biscuit and other dry provisions best; and all possible care should be taken to keep them dry, and free from dampness,

C H A P. V.

The cure of the disease, and its symptoms

IF proper precautions were taken for the prevention of this disease, and the rules which have been laid down for that purpose were complied with, we should seldom have occasion to meet with it in a high degree either at sea or land. It is indeed difficult to persuade some to practise, when in health, what is necessary to preserve so valuable a blessing. All mankind have not the benefit of a pure wholesome air, warm dry lodgings, with proper conveniences to guard against the inclemency of different weather and seasons. Many are all of necessity obliged to live upon such gross food as is not properly adapted to their digestive powers, to their constitution, and the exercise they use, so that from thence they may be apt to contract this evil. It is proper therefore to prescribe the cure for it, as well as the prevention.

Indeed the general method of it, and the best remedies, have already been taken notice of in the former chapter. Experience shews that the cure of the adventitious scurvy is very simple

simple, *viz.* a pure dry air, with the use of green herbage or wholesome vegetables, almost of any sort; which for the most part prove effectual.

Hence the first step to be taken towards its removal, when contracted either at sea or land, is change of air. We are upon this occasion informed by several authors, of an odd custom practised in some parts of *Norway* for the recovery of scorbutic people. They expose them in a neighbouring desert island in the summer-season, where they live chiefly on cloud-berries; and it is remarked, that, by eating plentifully of these berries, together with the change of air, they are restored to perfect health in a very short time. In that country, the fruits gathered by the diseased themselves, are reputed of the greatest virtue. It no doubt is the case, as by this means the patient breathes the salutary country-air in the open fields. Thus a free and pure country-air, with such moderate exercise as at the same time conduces to the agreeable amusement of the mind, is requisite.

Their food should be of light and easy digestion. The most proper is, broths or soups made with fresh meat, and plenty of vegetables, *viz.* cabbage, coleworts, leeks, onions, &c. Fresh and well-baked wheat bread must be gi-

ven them. Salads of any kind are beneficial but especially the mild saponaceous herbs, dandelion, sorrel, endive, lettuce, fumitory, and purslain. To which may be added, scurvy-grasses, cresses, or any of the warmer species of plants in order to correct the cooling qualities of some of the former; as experience shews the best cures are performed by a due mixture of the hotter and colder vegetables. Summer-fruits of all sorts are here in a manner specific, viz. oranges, lemons, citrons, apples, &c. For drink, good sound beer, cyder, or Rhenish wine are to be prescribed.

Thus, we have numberless instances of people, after long voyages, by a vegetable diet and good air, miraculously as it were, recovered from deplorable scurvies, without the assistance of many medicines. For which indeed there is no great occasion; provided the green herbage and fresh broths keep the belly lax, and pass freely by urine, sweat, or perspiration. But when otherwise, it will be necessary to open the belly, every other day or so, by a decoction of tamarinds and prunes, adding some diuretic salts; and upon the intermediate days, to sweeten the patient in a morning with camphorated be-luses of theriac, and warm draughts of *decoction*
lign

ign.; and, as has been usual in some of our hospitals, give twelve or fifteen grains of *pil. scillit. pharm. Edin.* twice or thrice through the day.

But it is here to be observed, that though the recovery of such persons seems promising and speedy at first, yet it requires a much longer continuance of the vegetable diet, and a proper regimen, to perfect it, than is commonly imagined. There are many instances of seamen who have been sent from the hospitals, after having been three weeks or a month on shore, to their respective ships, who in all appearance were in perfect health; yet, in a short time after being on board, relapsed, and became highly scorbutic. It were to be wished, that either a longer continuance was allowed such men at the hospital, or that their cure was rendered more perfect by a sweating course.

It is indeed frequently experienced, that people once deeply infected, are extremely apt to elapse into symptoms of this disease, in different periods of their life afterwards. There are likewise some particular constitutions, who, from the peculiar tendency and disposition of their humours to the scorbutic corruption, are, from much flighter causes, more liable than others to fall into the scurvy. In such cases,

these people, in order to purify their blood from this deep-seated scorbutic taint or tendency besides the diet and regimen before recommended, should also have recourse to other medicinal helps; some of the best of which have been already mentioned in the foregoing chapter.

But in this place I shall more particularly deliver,

1st, The method proper to remove a scorbutic habit of body, whether acquired by deep infection, or constitutional.

2^{dly}, The different treatment of scorbutic patients, adapted to the various symptoms of their disease; when the urgency of such symptoms requires a particular attention; but especially when the general method of cure cannot be complied with.

3^{dly}, I shall observe what remedies have been recommended upon good authority, and are used in different countries.

And, 4^{thly}, Conclude with some necessary cautions and observations.

To begin with the *first* of these: In order thoroughly to subdue a scorbutic taint, the physical intentions must be, to keep the outlets and emunctories of the body open and clear, for the gentle evacuation of the scorbutic acrimony

ny, (*viz.* the belly, urinary passages, and excretory ducts of the skin): mean while, the remaining mass of humours is rendered mild, soft, and balsamic, by proper antiscorbutic food and medicine. And it is to be remarked, that all the above evacuations are most successfully promoted, when the medicines for these intentions are joined with antiscorbutics.

Here milk of all sorts, where it agrees with the constitution, is beneficial; as being a truly vegetable chyle, an emulsion prepared of the most succulent wholesome herbs: but whey, by reason of its more diuretic and cleansing quality, is rather preferable. And upon this occasion the *sal polychrest.* will be found a very useful addition, as it is a mild purgative, an excellent diuretic; and when taken in a small quantity, well diluted, evacuates plentifully, either by perspiration or urine, according as its operation is directed to the skin or kidneys, by exercise, lying in bed, or keeping the body warmer or cooler.

Goats, of all animals, afford the richest whey, possessed of the greatest antiscorbutic virtues. It contains a most noble, restorative, vegetable balsam, which in a singular manner sweetens and corrects the scorbutic acrimony.

The

The *succi scorbutici* of the *Edinburgh* and *London pharmacopœia's*, where the volatile acrimony of the hotter species of plants is qualified by a due quantity of the juice of *Seville oranges*, are likewise proper in their season. They will be experienced yet more serviceable when made farther diuretic and cleansing, by being clarified with whey. Besides taking them in this manner through the day, the patient ought to be sweated in a morning, twice or thrice a-week, by draughts of the said juice mixed with sack-whey.

This method cannot be sufficiently recommended. It is an evacuation, which, of all others, scorbutic persons bear the best, and from which they find the greatest benefit; what nature pointed out to the northern *Indians* for the cure of this their endemic evil (*a*), and which experience confirms to be a most efficacious remedy. It is practised with remarkable success by the surgeons at the *Cape of Good Hope*, who have the greatest opportunity of treating scorbutic seamen (*b*); is recommended by the first and best writers on this disease (*c*)

(*a*) Vid. Part 3. chap. i.

(*b*) Vid. *Kolben's* account of the *Cape of Good Hope*.

(*c*) *Wicrus, Albertus, &c.*

and seems to have been the most usual way of their giving these juices.

There are, besides, other herbs, whose juices are here of eminent virtue. Such especially, from their saponaceous and mild aperient quality, are *scilla leonis* and *fumaria*. And an antiscorbutic superior to none, is the juice of the tender sprouting tops of green wheat, in the months of *June* and *July*, mixed with the juice of *Seville* oranges.

But, during all these courses, scorbutic habits will find great benefit by warm baths, (provided there be no danger from a hæmorrhage), in which the aromatic and fragrant plants have been infused, *viz.* rosemary, marjoram, thyme, &c.: and these are preferable to the usual manner of sweating them in stoves or bagnios.

In the winter-time, for the cure of this disease, genuine spruce beer, with lemon and orange juice, is to be prescribed; or an antiscorbutic ale by infusion of wormwood, *rad. raphani*, mustard-seed, and the like, made gently laxative by addition of fenna. It must be drunk when pretty fresh or new. But the spring is the most favourable season for a perfect recovery from a scorbutic habit.

HAVING

HAVING said this much on the cure of the disease in general, I come, *secondly*, to observe what is proper to be done for the relief and removal of its most urgent symptoms.

When first the patient complains of an itching and spunginess of the gums, with loose teeth, aluminous medicines will be found most serviceable in putting a stop to the beginning laxity of these parts. But, upon the putrefaction increasing, a gargle is to be used of barley-water, and *mel rosat.* acidulated with some of the mineral acids. The *sp.* or *elias vitriol* is generally prescribed; but some have imagined *sp. salis* less hurtful to the teeth. The quantity of the acid must be proportioned to the greater or lesser degree of putrefaction in the parts. The *fungus* must be often removed, or, if needful, cut away; and, by frequent gargarising, the mouth kept as clean as possible. Where the ulcers appear deep and spreading, they are to be checked with a touch of *ol. vitriol*, either by itself, or diluted, according as the patient bears it.

In a spontaneous salivation; or, as is much oftener the case, when a copious spitting has unfortunately been induced by some mercurial medicine, where immediate danger is apprehended

ended, speedy revulsion must be made from the salivary glands, by epispastics applied to different parts of the body, sinapisms to the soles of the feet and hams; and by opening the belly with glysters, and such gentle purgatives operate only in the first passages. But the impetus of the blood, and colliquated humours, here to be determined, particularly to the pores of the skin: a defect of perspiration, generally attended with a stricture and spasm in the *cutis* in scorbutic habits, being the true cause why the force of the mercury so powerfully falls upon the salivary glands. For this purpose, boluses of theriac, with camphire, and *flor. sulph.* are to be given, and repeated every four or six hours, in order to force a sweat; which proves the best means of abating the strength of the salivation, and rescuing the patient from the danger of being choked by it. Gargles at the same time must be used, with *oxym. scill.* to attenuate the thick and viscid *saliva*. When by this management the most threatening danger is prevented, there generally continues, for a considerable time, a troublesome salivation, with great putrefaction in the mouth; which it is very difficult to put a stop to. It may however be palliated

by keeping the belly and urinary passages open with glysters, or by diuretic and gentle physic; avoiding all strong cathartics, or whatever may farther promote the dissolution of the blood. Inviscating and glutinous medicines are sometimes serviceable, *viz.* *gum Arabicum*, *ichthyocola*, &c. dissolved in common drink. Astringent gargarisms of alum, and a decoction of the *cortex quercus*, are indispensably necessary: as also the *cort. peruv.* and *elixir vitriol.* taken inwardly. Mean while, the strength of the patient must carefully be supported by warm mulled wines, &c. Such persons, when much exhausted, are to be confined altogether to a milk and vegetable diet.

When the legs are swelled and œdematous gentle frictions are to be used at first, with warm flannel, or woollen cloths charged with the fumes of *benzoin*: and amber, or any other of the aromatic gums; provided the swelling be small, soft, and not very painful; rolling up afterwards with an easy bandage from below upwards. But if the legs are much swelled, stiff, and painful, they must be fomented with a warm discutient fomentation; which will afford some momentary relief without putting a stop to the progress of the swelling:

swelling: or what I have found preferable, is the steam of the fomentation received by the member well covered round with a blanket or cloths. And this operation must be repeated night and morning. It is generally followed with remarkable suppleness and ease in the stiff, painful, and contracted joints. Upon this occasion, I have indeed often prescribed the steam of warm water only, with the addition of a little vinegar, or crude *sal ammoniac*. After receiving the fume on their joints closely covered up for half an hour, they are to be anointed with *ol. palmæ*. If such swellings are not removed soon after being put upon a vegetable diet, the limb should be sweated by burning of spirits, or with bags of warm salt.

Ulcers on the legs, or any other part of the body, require pretty much the same treatment, *viz.* very gentle compression, in order to keep under the *fungus*, and such antiseptic applications as have been recommended for the putrid gums, *viz.* *mel rosat.* acidulated with *sp. vitriol.* *ung. Ægyptiac.* &c. But nothing will avail where the patient cannot have vegetables or fruits.

In dangerous hæmorrhages from these ulcers, or from the gums, nose, &c. the mine-

ral acids, *viz.* *sp.* or *el. vitriol.* are to be given and often repeated, in small quantities at a time, so that they may more certainly and easily enter the lacteals, and get into the blood together with small doses of the *cort. peruv.* when it agrees with the stomach. These likewise, with red-wine, are the principal medicines to be relied upon in their putrid and colliquative fevers.

For pain of the limbs, in the small of the back, and breast, and universally in most of their pains, whether fixed or wandering, the *oxym. scill.* is to be administered in a warm diaphoretic mixture; where wine must supply the place of a spirituous cordial: and the patient, upon going to bed, should, by warm draughts of water-gruel, with vinegar, or, in place of the latter, the *acetum theriacale*, endeavour to force a sweat. But most of these complaints yield readily to the general method of cure, and can only be palliated until that is undergone (*d*).

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(*d*) *Extract of a letter from Mr Murray.*

N. B. The letters (*a*), (*b*), (*c*), (*d*), refer to some remarks subjoined.

Untoward fortune has too often placed me among a number of scorbutic patients, where vegetables and proper diet, and even many necessary medicines, were wanting, and where the

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There remain two symptoms of this disease, which are, of all others, the most obstinate to remove, even though the patient enjoys the benefit of the purest air, with the most proper antiscorbutic

every elements were our enemies; and I have spent many melancholy hours considering what was best to be done to overcome this enemy, and stop the progress of this often fatal, and always loathsome distemper. And although I have seldom cured my patient without vegetables; yet the relief I have given to many, amply rewarded my labour, and the reflection to this day gives me pleasure. I shall first give you my method in general, and then I can produce an instance of its success.

Many at the time had a miliary fever, which I then judged to be purely scorbutic. But, since the receipt of your last letter, I have altered my opinion; and submit to your decision, that there is no such thing as a fever that may be so termed. I was always averse to bleeding, for the reasons you give: yet if the scurvy was the primary disease, (as I then judged it), preceded by high febrile symptoms, and the habit was originally found to be plethoric, I never observed any hurt from the loss of a small quantity of blood; which made a succeeding vomit always more safe; and this was followed by a purge, either cooling or warm, as symptoms indicated. Of the first sort was the purging salts, with *sal tartar.* or *tartar. vitriolat.* dissolved in *decoct. lignorum;* or *infus. sennæ et tamarindor.* &c. Of the last kind was *infus. tamar. cum senna,* with the addition of a proper quantity of *canella alba.* And these were repeated occasionally.

So soon as the symptoms of scurvy appeared, I discharged the use of salt meat; and confined my patients to the vegetable articles of diet on board, with what fresh victuals could be had from the officers tables. Their common drink was *decoct. lignor.* with their allowance of rum (*a*) put into it. The medicinal course I put them under, was for most part a neutral mixture of vinegar and *sal tartar.;* of which I gave from two to four

antiscorbutic food and medicines. These are the scorbutic dysentery in some; and in others a hard bound cough, accompanied with *dyspnoea*, pain and disorder in the breast. This last

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four ounces twice or thrice a-day. *Spirit. mindereri* was beneficial to some; but the small quantity of volatile salts or spirit carried to sea, prevented that from being a general medicine. I have also given a mixture of *cremor* and *sal tartar.* with succre and sometimes *tartar. vitriolat. (b).* In violent scorbutic pains, diaphoretic anodynes of *acet. theriacal.* or *theriac. andromach.* with *spirit. mindereri.* and *oxym. scillit.* I have found very serviceable: as likewise the last in particular for disorder of the *thorax.* In visceral obstructions, I gave the ferulaceous gums, with *gum. guajac.* soap, and *tartar* of *vitriol;* and sometimes added only *gum. guajac.* and *tartar* of *vitriol* to the squills. The liver or spleen, perhaps both, are sometimes affected especially that lobe of the first which stretches over the *pylorus.* Hence I have known violent pain at the pit of the stomach; and the hardness and pain I have sometimes observed in the *fundus* of that *viscus,* leave no doubt of the *pancreas* being also obstructed. The mesenteric glands share the same fate. Hence, as observed in your description of this disease, towards the close of it, from these obstructions proceed violent colic-pain, jaundice, &c.; all which I have seen; as also great tension of the *abdomen,* lenteries, &c. The appetite then begins to fail, the lungs are affected, respiration becomes contracted, the motion of the heart less vigorous, the circulation languid, and placid death closes the scene.

But to return to my practice at sea: Where there was any typical pain, I fomented with a ley of wood-ashes, in which was boiled camomile and elder flowers, wormwood, rue, &c. and lemon-peel, when it could be got. For the fungous gums, I made a powder of *bol. armen. alum. rup. tart. vitriol.* and *gum. myrrh.*

ften ends in a consumption: while the former, or flux, is very troublesome to stop, and sometimes also proves fatal.

Scorbutic

myrrh. washing them with *infus. salviæ*; to which I added *alum. sp.* and *el. vitriol.* or *sp. sal.*; which served also in ulcers, when I added honey. These last I touched frequently with a rag dipped in *mel Ægyptiac. rosat. sp. sal. d. et tinct. myrrh.* I dressed all ulcers of the extremities chiefly with *ung. Ægyptiac. mercurial.* and *liniment. arcæi* mixed together. When the patient was altogether free from feverish symptoms, I gave three or four ounces twice a-day, along with *decoct. lignorum*, of the *tinct. ad stomachicos (c) Phar. Ed.*; to which I added mustard-seed and *canel. alba.* When he began to recover, I strenuously insisted on his using exercise, and embrocated the contracted joints or tendons as you direct. Such was my general practice; and the following is an instance of its success.

Benjamin Lovelay, aged 25 years, had a continual fever in September 1746; for which he was sent to the hospital at *Louisburg*; and from thence returned, to all appearance well, the 13th October following. On the 30th November, (being taken ill the day before), he was feverish, and complained of violent pain in his bones and joints. Upon account of the scurvy being then epidemic, he was very sparingly bled, took a vomit, and was purged. Upon which the fever subsided a little; and there appeared a miliary eruption, soon after followed with the several scorbutic symptoms in the greatest degree; to which was added a violent pain in the pit of his stomach, inclining to the right side, often so violent as to make him shriek out. The symptoms continued upon the increase for some time; and at last he grew so bad, as to faint away upon the least motion. The antiscorbutic regimen above described was steadily pursued. His common drink was *decoct. lignor.* acidulated with *elixir vitriol.* His diet was water-gruel, rice, sago with wine, and sometimes

Scorbutic diarrhœas at sea are not sudden to be stopt; as the acrimonious humour mu

sometimes a little fresh broth or meat from the officers table. The several forms of medicines already mentioned were administered as symptoms required; and I think he had almost every symptom belonging to the disease, attended with feverishness all along till the decline of the distemper; when I added also and *extract. gentian.* to his pills, and begun the use of the *tinct. ad stomachic.* The bile in most chronical diseases, especially the scurvy, is defective either in quality or quantity, and something must be given to supply its defects. The disease took turn for the better in the beginning of *January*, and he returned to his duty on the 22d of *February (d)*.

I shall use the freedom with my ingenious friend to make some remarks on his letter.

(a) Wine would probably have been better: for whatever effects rum diluted in this manner with an antiscorbutic medicine might have had; yet all distilled spirituous liquors may be suspected as hurtful.

(b) The medicines were no doubt properly adapted in the cases to which they seem to allude; which were fevers and scurvies: these saline neutral draughts being certainly preferable in such cases to the soap, squill, and garlic pills, commonly prescribed in scurvies without a fever.

(c) The medicine recommended, is truly an excellent restorative; proper for prevention of the scurvy in such as are recovering from other diseases, and to confirm the strength of scorbutic persons when in the convalescent state. But I must own like medicine did not agree with those who were in neither of these situations to whom I gave it. Bitters of the terebinthinate kind, though dry and kept; also all fresh and succulent plants and fruits of this quality, are nevertheless most efficacious antiscorbutics.

(d) The case is curious and singular.

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some way or other be discharged; and it may as well pass off by the guts as by any other outlet. They, however, are to be moderated. The tone of the intestines must be strengthened: mean while, the peccant humour is gently evacuated by small doses of rhubarb, occasionally repeated; to which a little *theriac.* or *diascord.* always to be joined, with a view to keep up perspiration; an important point. For this purpose, *decoctum fracastor.* or boluses of *diascord.* with other warm diaphoretic and strengthening medicines, are principally to be given; and *opium* more freely, in extreme cases. Mean while, the patient is supported with strong rough red wine, diluted, and a glutinous subastringent diet. I have sometimes given four or five grains of crude alum in a *diascord.* bolus, where the blood was evacuated in great quantity; and when it passed the stomach without ruffling, it generally did service. In this last case, *tinct. rosar.* well acidulated, and other styptics, are necessary.

I know no peculiar treatment proper in the scorbutic dysentery, different from what has been recommended by authors on that disease, farther than that the use of greens, and especially of the austere and acid fruits, is to be per-

mitted. I am informed by Mr *Christie*, formerly surgeon to the naval hospital at *Port-Mahon* that, after trial of many medicines, he found an infusion of *ipecacuan.* in brandy, given in small quantities, often repeated, the most effectual remedy to remove it. Rhubarb-purges, stomachic bark-bitters, *elixir vitriol.* or the use of some light steel mineral water, will serve to perfect a recovery here; as in all other scorbutic cases, where the patient has been much exhausted by colliquative evacuations and hæmorrhages, usual in this disease.

For scorbutic pectoral disorders, blistering and issues are proper at land; as also riding on horseback in the country-air; an entire milk and vegetable diet; keeping the breast open by expectorants. Such are *oxym. scillit. gum. ammoniac.* and *bals. copairv.*

When the scorbutic taint has been entirely subdued, it sometimes leaves behind it other disorders; which require the same treatment is proper for them when proceeding from other causes; together with a mixture of antiscorbutic medicines for farther security.

Besides the consumptive disposition now mentioned, a dropical habit is now and then contracted; or, what is more frequent, the legs

main swelled, œdematous, and ulcerated. In this last case, if the ulcers have been of long standing, sufficient provision being made for healing them up, by purging, and issues near the part, an electuary of the prepared crude antimony may be given, with the addition of æthiops mineral; and at the same time an antiscorbutic et-drink used: or, provided they are obstinate, and the gums sufficiently hardened, the patient may undergo a slow and gentle course of mercury. In scorbutic habits, I generally mix the mercury with a small quantity of *bals. sulph. tereb.* and find it succeed well, where the intention is not to raise a copious salivation. A bottle of decoction of the woods must be drank every day at the same time. This, by promoting a diaphoresis, will assist the operation of the mercury, and determine the dissolved humours more particularly to the cutaneous secretion. After this course, a few grains of *sulph. aur. antim.* will perhaps be necessary evening and morning, or Dr *Plummer's* medicine (*e*), and the continuance of the decoction of woods; which in all probability will complete the cure.

Those that are troubled, after having been

(*e*) Vid. *Medical Essays*, vol. 1.

afflicted in the scurvy, with numbness and pain in their joints, or chronic rheumatic pain, must practise riding, swallow a spoonful of unbeat mustard-seed once or twice a-day, or undergo the mercurial course as above directed, and be well sweated.

It may be now proper to observe, in the *third* place, what other remedies have been recommended for this disease, and are reputed in different countries. I elsewhere (*f*) took notice of the *pinus antiscorbutica*, the spruce shrub, and their virtues. The learned *Boerhaave* is said to have prescribed, for the most part, new churned milk. *Cort. winteran.* first came into repute, from the good effects it was supposed to have had in Captain *Winter's* crew belonging to Sir *Francis Drake's* Squadron.

There is a remarkable observation given us by *Bernard Below* (*g*), of the great virtue of *herb vermicularis*, wall-pepper, in this disease. He boiled eight handfuls of the herb in eight pints of old ale, to half the quantity, in a close vessel. Of this a warm draught, *viz.* three or four ounces, was taken every morning, or every o

(*f*) Page 222.

(*g*) *Miscell. curios. medico-physic. academ. natur. curios. ann. 1701. et 7. obs. 22.*

her morning, on an empty stomach, as the patient bore it: which had the happy effect to cure almost all the soldiers of the army afflicted in this disease; excepting a few, who, by the severity of the preceeding winter, were reduced into a condition past recovery. He remarked, that those who were vomited easily and most plentifully by the medicine, soonest recovered. He made use of this decoction, with the addition of alum and *mel rosat.* by way of gargle for the gums, which were in all affected and purrid; and by this simple remedy cured above fifty, who had the tendons in the ham contracted, applying the boiled herb warm to the part. He bathed their ulcers with the same decoction, and applied the warm herb to them in like manner.

There is an instance given by *Etmuller (h)*, of the soldiers in a besieged garrison greatly over-run with this disease, who were all perfectly cured by *ruta muraria*, white maiden hair.

Chelidonium minus, pilewort, or little celandine, for its supposed great virtues, has by the Germans been called *schorbock rout*. But the

(h) *Schroderi dilucidati phytologia.*

Danes (*i*) esteem most *trifolium palustre*, maritime trefoil; which they administer sometimes by itself, at other times with the addition of scurvy-grass.

We are informed (*k*), that the *Swedes*, ever since the surprising recovery of their troops when afflicted with this malady, by the use of a decoction of fir-tops, esteem it altogether specific in the scurvy.

In *Groenland*, where this disease is extremely frequent, we are told by a gentleman (*l*) who twice visited the country, that the natives make use of scurvy-grass (*m*) and sorrel together with them.

(*i*) Vid. *Aët. Haff.* vol. 3. obs. 75. *Etmul. Schrod. dilucidati phytol.* p. 104. *Simon. Pauli digress. de vera causa febrium scorbuti, &c.*

(*k*) Vid. *Moellenbroek*, p. 116. *Etmul. Schroderi dilucidati phytolog.* p. 2. See the account of it, chap. 4.

(*l*) *Hermannus Nicolai.* Vid. *Aët. Haffn.* vol. 1. obs. 9.

(*m*) Communicated by the ingenious Mr *Thomas Maude*, surgeon in *Brookstreet, Holborn.*

The ships who are annually employed in the whale-fishery are of all others the best fitted out, both as to the variety and quality of their food; the voyage is short, and the seamen kept much in action: so that bad water and decayed provisions can scarcely fall to their share. Yet it is notoriously known, that there is no part in the world where ships crews are so liable to the scurvy, as in the polar circle. Those who are seized on their first entrance into the cold, find an increase of their symptoms when got into the ice. The attack of the ma-

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er; and that these two herbs, put with barley or oats in broths made of fowls, or the flesh of rein-deer, have an effect to recover the diseased most surprisngly in a short time, even after having lost the use of their limbs.

The *Norway* cure affords the only one well-tested instance, of this distemper being successfully removed by what would seem so diffe-

rently is here more sudden, and its progress more rapid, than any where else. The patient has seldom any cure or alleviation till the weather softens: for the month of *July* is very moderate, which is almost the only pause of winter; and at this time the scurvy-grass steps in, and performs incredible wonders. I have been an eye-witness to many scorbutics who have recovered in a few days, from what one would judge an irrecoverable state, by a plentiful use of this *Greenland* salad. It is much coveted by the sound as well as sick. Our field and garden scurvy-grass are bitter and pungent; this is mild and esculent, resembling our sea scurvy-grass, or *cochlearia minima ex montibus Wallae*. It is said to acquire a pungency, if transplanted into warmer countries; but this circumstance I much doubt. However, be that as it will, its efficacy in the scurvy is there an undoubted and daily experienced truth; and it may be justly esteemed one of the most powerful antiscorbutics in the world. Vegetable food prevails over the sea-scurvy in all parts; but this reinstates in as many hours, as any other course requires days. I cannot dismiss these reflections, without observing how kind and provident Nature has been in the plentiful supply of this sovereign plant every where in that country. *Ubi morbus ibi remedium*, is an observation of antiquity; and nowhere more justly verified than in the present case.

rent from the nature of vegetables, as a fossil or earth. It is related by authors of undoubted credit (*n*), particularly by *Petræus* (*o*) who practised at that place; and seems to have been known before *Eugalenus* had confounded most other diseases with the true scurvy; as it is taken notice of in the year 1624 by *Senner-tus*, when *Eugalenus*'s writings, in all probability, might not have reached *Norway*. It is a reddish or blackish earth, dug up nigh *Bergen*; of which, from half a dram to a dram is the dose; and operating by sweat, it is said to cure the patient in a short time.

I mentioned two very bad scorbutic cases which lately occurred in *Fife* (*p*). The surgeon, upon seeing the patients, inquired what had been their ordinary food, and whether they commonly eat any green herbs or vegetables? One of them, a fisherman, replied, That he lived upon bread, dried and salted fish, which was all he could afford; and sometimes salt beef, of which last he was very fond. The surgeon desired them to abstain from their former diet; in place of which, they were to

(*n*) Vid. *Wormii musæum*; *Bartholini epist.* cent. 1. n. 89.

(*o*) Vid. *Dissert. harmonic.*

(*p*) Vid. Chap. 2. p. 174.

make two good meals a-day upon a vegetable soup, prepared of coleworts and other green garden-stuff; and to eat water-creffes by way of salad. He besides prescribed a fomentation for their legs, and gave them a dose or two of very gentle physic. By which means they both recovered; and one of them soon after, overjoyed upon being restored to the use of his limbs, walked several miles to return the gentleman thanks for his salutary advice.

I shall now conclude what I have to say on this head, with the following cautions and observations.

Ist, As to evacuations: It is to be observed, that this disease, especially when advanced, by no means bears bleeding; even although the most acute pains upon the membranes, a high degree of fever, and dangerous hæmorrhages, would seem to indicate it. The patient generally dies soon after the operation. Nor does it bear strong cathartics, which are often unjudiciously administered in its commencement; many of which only farther promote the colliquation and acrimony of the blood and humours. The belly must at all times be kept open, but chiefly by such laxative food, when green vegetables cannot be obtained, as

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may answer this purpose, *viz.* barley and currants, stewed prunes, &c.; or with a decoction of tamarinds and *cremor tartar.* a morsel lenitive electuary, sea-water, and the like. From blisters there is danger of a gangrene. As to vomits; though I never have had any great experience of their effects; yet, by the observation of others, squill-vomits have been found serviceable.

2dly, Persons in the advanced stages of the disease, are not, without great caution and prudence, to be exposed to a sudden change of air, or brought up from lying a-bed below in the hold of a ship, to the fresh air, in order to their being landed. On this occasion, though seemingly pretty hearty, they are to be given a glass of generous wine, well acidulated with lemon or orange juice; which is likewise the best cordial in their fainting-fits. When they drop down seemingly dead, it were to be wished, that some methods were tried for their recovery; as putting them into a warm bed; using of strong stimulants, and frictions; blowing into the lungs, *anus,* &c.

3dly, After a long abstinence from green and fruits, scorbutic persons should be treated like one almost starved to death; that is, no
permitted

permitted for a few days to eat voraciously, or surfeit themselves with them; otherwise they are apt to fall into a dysentery, which often proves mortal.

Lastly, There are but few medicines carried out in a sea-chest, which are here of service. Those of the fossil or mineral kind, such as steel, antimony, and especially mercury, do manifest harm. Opiates occasion an unaccountable lowness and dejection of spirits, with an oppression on the breast. When they are absolutely necessary, as in fluxes, they must be given always of the warmest kind; and agree best, when, before or during their operation, a stool is procured: after which the patient is to be refreshed with wine. Where the breast was much affected, I always gave them a draught of squill-mixture; or, in case the stools were not very frequent, I added a few grains of vitriolated tartar to the opiate bolus, in order to procure a discharge that way.

After trial of many medicines in the sea-voice, there are but two I can principally recommend.

The first is the *cort. peruv.* infused in wine. I gave at the same time a decoction of *lign. guajac.* (of which there is great plenty in ships),

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with

with the addition of *rad. glycyrrh.* which prevented the heartburn that the decoction otherwise occasioned. The bark did not always agree with the stomach; but where it did, I observed a more favourable appearance upon the gums and ulcers, by its checking the putrefaction: and in two instances where a gangrenous disposition was induced by too tight a roller, the suppuration next day was more laudable. It was of use in salivations and hæmorrhages, but rather hurtful in fluxes. Warm draughts of the decoction gave always relief, if the patient sweated; in which case the bark also agreed better.

But another, and more excellent medicine, is the *oxym. scill.* from which I have experienced extreme good effects. It generally kept the belly open, and promoted the secretion of urine; by both evacuations discharging the acrimonious humours. It gave relief in many of their complaints, particularly those of the breast, which scorbutic people are seldom freed from. I had formerly gathered a great quantity of this root when at *Minorca*; and having made the *oxym. scillit.* gave it to most of our patients in the year 1747, at the rate of one ounce, or an ounce and a half, in the space of twenty

twenty-four hours, with remarkable ease of their complaints (*q*).

Conclusion of Dr Grainger's letter (see p. 173.), giving an account of scurvies at Fort-William.

— Warned by my former mistake, I never used the lancet, unless the patient was uncommonly plethoric; and then too a very small quantity of blood answered the purpose. I have seen fellows who have often borne the loss of twenty ounces, faint when only six were drawn from them at this time. Upon standing, it did not separate, but appeared like the blood in malignant fevers, altogether dissolved, and of a livid colour. Some of the symptoms, vomits of *ipecacuan*. rather increased, *viz.* pains, faintishness, *dyspnœa*, bleeding of the gums, &c.: they abated none of them. Indeed it was lucky that the stomach seldom required their administration.

(*q*) The eminent antiscorbutic virtue of the squill or sea-onion, at the same time that it confutes the groundless opinion of the ill effects of acrid medicines in the most putrid scurvies, in some measure confirms the efficacy of what has been recommended in the foregoing chapter, and has been so often experienced beneficial for prevention, *viz.* common onions, and even garlic, as in some respects they are all of similar virtues.

Purgatives,

Purgatives, however, were found highly beneficial, though repeated every third day. They not only removed the troublesome symptoms arising from costiveness; but their operation, though sometimes pretty brisk, I never observed to impair the patient's strength, and always remarkably abated their excruciating tortures. Although I gave at first an infusion of jalap; yet, observing bloody stools to have ensued on its use, I afterwards exchanged it for a ptisan of *senna*, with *cremor tartar.*; which seemed to answer better. One man drank salt water every other day, and found it a serviceable purge. Would it cure the scurvy?

But these, though useful, were not able alone to cope with the distemper. An attentive consideration of its symptoms seemed to shew it was putrid. On this I founded my practice; and had soon the pleasure to find that success confirmed my conjecture.

The antiseptics I chiefly used, were, *el. vitriol.* to the quantity of half a dram twice a-day in water; or *sp. nitr. dul.* in a smaller dose. A gentle *mador* was also solicited by a bolus of camphire and nitre, of each half a scruple, given every night. For this purpose too they were allowed to drink plentifully of warm sage tea

tea; which, with the assistance sometimes of
glass of mulled claret, seldom defeated our
intentions. If they did not sweat, an increase
of very foetid urine supplied happily that dis-
charge. Greens were proper: but as they
could not be had, broths made of young flesh,
kid, &c. with barley, were indulged them;
whilst camomile drank like tea, afforded a truly
medical breakfast. The good effect of this
management was soon visible in all.

Ulcers of the gums, &c. not only required
the continuance of the prescribed measures,
but the bark, and detergent gargarisms, were
found indispensable auxiliaries. I have applied
blisters to the pained members. The practice
did not answer. They brought on a gangre-
nous disposition in one man; which bark, and
the strongest antiseptics, with difficulty put a
stop to; and in all rather increased their tor-
ments. The following epithems were found
highly anodyne. *Rx. sp. è hordeo elicet. (vulgo*
whisky) acet. acerr. ana lib. i. sp. tereb. lib. ss. sal.
tart. unc. ss. M. The milder was, whisky and
vinegar *p. æ.* camphire and soap *q. s.* With one
or other of these the discoloured and pained pla-
ces were chafed. Their gums at the same time
were not neglected. The pain of them made
the

the men extremely importunate for relief. On all the applications at that time used, I found the greatest service from tobacco-juice and *tin myrrh. et aloës*, rubbed on them several times a day. Alum-water, and oak-bark decoction restored their usual firmness.

In two weeks time, sometimes sooner the symptoms began to abate, the *maculae* turned brown, and in four weeks they complained only of weakness. This, bathing in the sea, and aromatic bitters with steel, soon removed. I had the good fortune not to lose a single man.

C H A P. VI.

The theory of the disease.

IN order to understand the true state and condition of the body under this disease, some things must necessarily be premised from the known and established laws of the animal œconomy.

An animal body is composed of solid and fluid parts; and these consist of such various and heterogeneous principles, as render it, o
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substances, the most liable to corruption and
 putrefaction. Such indeed is the state and con-
 dition of every living animal, as to be threaten-
 ed with this, from the mechanism of its own
 frame, and the necessary laws of circulation
 by which it subsists. For by the uninterrupt-
 ed circulation of its fluids, their violent attri-
 tion, and mutual actions on each other, and
 their containing vessels, the whole mass of hu-
 mours is apt to degenerate from its sweet, mild,
 and healthful condition, into various degrees
 of acrimony and corruption. Parts of the so-
 lids themselves, continually abraded by the re-
 peated force of the circulating fluids, are again
 turned into their channels. Hence the ne-
 cessity of throwing out of the body, by diffe-
 rent outlets, these acrimonious and putrescent
 humours, rendered thus unfit for the animal uses
 and functions, together with the abraded par-
 ticles of the solids. And a daily supply of food,
 and fresh nourishment, is required to recruit this
 constant waste, both of the solid and fluid parts.
 Thus the bodies of all animals are in a con-
 stant state of change and renovation, by which
 they are preserved from death and putrefaction.
 There are two evacuations chiefly by which
 the blood is freed from these putrescent noxi-

ous humours, *viz.* urine, and insensible perspiration. Not but that there are many other excretions necessary to health: yet they are rather more properly adapted to other singular and peculiar uses; except that of stool, which in some cases may be substituted as a vent to the corrupted humours, upon the defect of either of the other two.

It would seem, that, by the urinary passage the rancescent oils and the acrid salts of the blood, together with the earthy recrements, broke off from the solids, are daily washed away, and expelled out of the body.

But the most considerable of all the evacuations, is that by insensible perspiration; which *Sanctorius* found in *Italy* to be equal to five eighths of the meat and drink taken into the body. Most of the observations made by this author will be found true; as they have been confirmed by repeated experiments, by *Keil* in *England*, the learned *Degortet* in *France*, and others (*a*); making a proper allowance for the different climates they lived in, their different ages, ways of life, and constitutions. Upon which subject, I shall here

(*a*) Dr *Lining* in *South-Carolina*, Mr *Rye* in *Ireland*, and *Robinson*.

erve, that, considering how often animals, as well as plants, as appears by many experiments, are in an absorbing and bibulous condition, the exact quantity perspired cannot at all times be justly determined, without knowing the quantity imbibed. Upon this consideration, however, it will appear, that in many cases it often exceeds the quantity assigned by *Sanctorius*. It is indeed, beyond doubt, the most copious evacuation of the whole body: and though it is sometimes in greater or lesser quantities, as influenced by various causes; yet it can never be partially suppressed long, much less can it be entirely obstructed, without the greatest detriment to health. For should its effect for a short time be supplied by some more copious and increased evacuation, as it sometimes is by that of urine or stool; yet towards perfect health, the integrity of all the animal functions, more especially the natural evacuations, are requisite: there being somewhat thrown out of the body by each, which cannot so conveniently pass another way; as *Sanctorius* rightly observes, of any other evacuation substituted for this, “It diminishes

“ the quantity, but leaves behind it the
“ quality” (*b*).

It may be proper farther to remark, that this being the last and most elaborated action of animal digestion, the body is hereby freed from what is consequently the most subtle and putrescent of the animal humours. And it is certain these excrementitious humours naturally destined for this evacuation, when retained long in the body, are capable of acquiring the most poisonous and noxious qualities, and to a very high degree of putrefaction (*c*); becoming extremely acrid and corrosive: and do then give rise to various diseases, according to the habit or constitution of the person, *viz.* the state of the solids and fluids at that time, or the influence and determination of other causes.

Moreover, not only due and constant evacuations of what may be rendered thus so extremely pernicious to the body, are requisite towards the health and life of animals; but a fresh and daily supply of a soft and mild liquor such as the chyle, is farther necessary to correct and prevent the constant natural putrescent tendency of the humours, and to sweeten and

(*b*) *Aph.* 19.

(*c*) *Vid. Hoffman. de venenis corporis humani. Sanctior. aph. 4*
dilut

dilute the acrimony which they daily and hourly contract from the action of the body, and by life itself. It appears, that animals starved to death, do not perish from want of blood, or an insufficient quantity of other juices, but from the corrupt and putrid state of them.

It would be foreign to my purpose, to observe what various degrees and kinds of putrefaction may be induced in the human body by other means, (*viz.* by putrid ferments, or putrid substances of any kind, contagious poisons, and acrimony of different sorts, either taken inwardly, or outwardly applied); as the scorbutic putrefaction, it will appear, is purely the natural effect of animal heat and motion caused by the action of the body. How long life may be preserved during this putrefaction of the animal, or what degree of corruption in the humours may subsist during life, it is not easy to determine; though, beyond all doubt, such an alcalescent state or acrimony in the blood as is described by some authors, is not consistent with life. Alcaline and putrid substances are very different.

This being premised, I come now to observe the effects upon the human body of the several causes which are remarked to give rise to the scurvy.

scurvy. *First*, An intense degree of cold such as we have sometimes during severe winter in our own country, but especially such as the crews felt who wintered at *Spitzbergen* and *Greenland*, and is common in the winters in *Groenland* and *Iceland*, is experienced to be among the predisposing causes to this disease.

The obvious effect of cold on the human body is, to constrict the whole external habit, to dry and corrugate the skin; and all statical experiments prove, that cold obstructs or diminishes insensible perspiration. *Degorter* observed, that, *cæteris paribus*, the perspiration was always less, the greater degree of cold there appeared to be from the thermometer (*d*). *Sanctorius*, who lived in a country where the winters are seldom long and severe, gives us a very just aphorism (*e*), if rightly understood, on this subject. It is, That, during a cold constitution of air, the robust (or such as have strong elastic fibres, and a dense blood, by which a great degree of heat overcoming the force of the external cold, is soon generated in them, especially by muscular motion or exer-

(*d*) *Tract. de perspir. cap. 12. § 34.*

(*e*) *Frigus externum prohibet perspirationem in debili, in robusto vero auget, aph. 68.*

ercise) may be made to perspire much more than at other times. But in weak persons, or those that use no exercise, and universally in all who cannot bring themselves into a degree of heat exceeding that of the atmosphere, perspiration will be lessened, according to the different degrees of cold to which their body is exposed; and which, when very intense, entirely stops this necessary evacuation. Hence such as use exercise, and keep warm, during cold winters, are not so subject to scorbutic complaints, as those who are weak, and use none.

But it must be remarked, that cold joined with driness and purity in the air, by keeping up a due degree of tension in the solids, is not naturally productive of this disease. It may indeed be supposed, that when the cold becomes very intense, as in the winter in *Greenland*, the vital or animal heat of the body may be so overcome by it, that the digestive faculties (as in a person starving with cold) are chilled and enervated; and the solids being overbraced by so high a degree of cold, may at last lose their tone or elasticity. In this case, the constitution becoming gradually habituated to an overcharge of what physicians call the *serosa colluvies*,

colluvies, by a long obstructed perspiration; instead of coughs, stiches, pleurifies, and the like disorders of the inflammatory kind, usual in such seasons from too tense fibres, the scorbutic *diathesis* may more naturally be contracted, especially if such food only is used as must contribute to form the disease. But this though probable, cannot be ascertained from fact; because, as I observed elsewhere (*f*) these northern countries, above all others, are continually pestered with fogs, even during their severest frosts. And by all faithful and accurate observations made on this disease, moisture is experienced to be the principal and main predisposing cause to it. This indeed of itself is sufficient to dispose the constitution to the scurvy in any climate, even the warmest. It is observable, that, in warm climates, the crews of ships at sea are liable to this malady, when the hot weather, by which the fibres of the body are much relaxed, is succeeded by great and incessant rains usual in these latitudes, or when the season proves very unconstant. The disease is there likewise much owing to the great length of these southern voyages. But, otherwise, it is not near so frequent a calamity as in

(*f*) P. 130.

older climates; the bad effects of moisture being rendered much more pernicious when combined with cold. A cold and *moist* constitution of the atmosphere, together with wet lodgings, damp beds, cloaths, and other inconveniencies which poor people necessarily suffer at such seasons, is the most frequent and strongest disposing cause to it. And, upon the whole, it is to be remarked, that whatever shuts up the pores of the skin, and impedes or lessens perspiration, which moisture or dampness effectually does, and that more strongly with the addition of cold, is chiefly productive of this disease.

Sanctorius, in several places, describes such scorbutic constitution of air, and its effects, as is often met with at sea: "Too cold; windy, or wet air, lessens perspiration" (*g*). He had before enumerated almost all the causes which obstruct this evacuation, and occasion the disease, *viz.* "*aër frigidus, cœnosus, et humidus, natatio in frigida*, gross viscid food, and a neglect of exercise" (*h*); and observes the consequence of perspiration being obstructed by such a moist gross air: "It converts

(*g*) Aph. 200.

(*h*) Aph. 67.

“ the matter of transpiration into an *ichor*
 “ which being retained, induces a cachexy” (*i*).
 He very justly afterwards paints out the scorbutic cachexy, when describing the effects of humidity, or of such an indisposition of air as produces the scurvy: “ Here perspiration
 “ stopt, the passages of it clogged, the fibres
 “ are relaxed; and the transpiration retained
 “ proves hurtful, and induces a sensible weight
 “ in the body” (*k*).

This he found by statical experiments to be the fact. But, for the better understanding of these excellent aphorisms, it may be proper to observe, that, upon the state of the atmosphere, the strength and weakness of the fibres of our body in a great measure depend. Too moist an air not only stops up the pores of the skin, but weakens and relaxes the whole system of solids. Hence, during a rainy cloudy season, all the members of the body feel heavy, the appetite is diminished, the pulse of the heart and arteries is more feeble, and every one is sensible of a languor of strength, and lowness of spirits. Farther, moisture, by weakening the spring and elasticity of the air, ren-

(*i*) Aph. 146.

(*k*) Aph. 148.

renders it unfit for the many salutary purposes obtained by respiration. Such an air not being able to overcome sufficiently the contractile force of the pulmonary fibres resisting the dilatation of the lungs, the blood is not here sufficiently comminuted and broken, nor that *menstruum* removed which it had contracted in its slow returning motion through the veins. From the impaired action also of this *viscus*, the last and most important office of animal digestion upon the chyle, that of sanguification, is not duly performed. As we always find, that those who have their lungs faulty, can never be properly nourished; so indeed there can be no good digestion without pure air. This is necessary; as it mixes with the aliment in the mouth, has free access to the stomach, and through the whole intestinal tube, where it is a very active cause of digestion; but chiefly as it assists the lungs in performing that function of assimilating and converting the crude chyle into blood. Hence, during a moist constitution of the air, improper food, or such as affords a too viscid and tenacious chyle, can never rightly be converted into this vital juice, for the support and nourishment of the body.

But, further, persons in such situations where

they are continually exposed to moist air, in damp lodgings, in wet cloaths, beddings, & are found to absorb great quantities of the surrounding moisture (l). And these obstructed and imbibed humours becoming more and more acrid, this serous *colluvies*, in length of time turns putrid in the human body (m). All animal substances have naturally a tendency to corruption in too moist an air.

(l) Dr Keil (*Med. Stat. Brit.*) seems to have been of opinion, that the disorders said commonly to depend on retained perspirable matter, were owing to noxious particles absorbed. It must be owned there is some difficulty in this matter: for though the balance shews the quantity of perspiration to be equal to five eighths (or whatever else different authors have assigned) of the *ingesta* more than what is absorbed; yet the quantity perspired may greatly exceed this, since the quantity absorbed is unknown. Moist air loaded with more heterogeneous particles than dry air, may often produce bad effects, as much, or perhaps more, by absorption of these particles, than by stopping perspiration. But it is sufficient to our purpose, to take it for granted that moist air obstructs perspiration, which is universally acknowledged. And we have no occasion to investigate the peculiar quality of the heterogeneous particles absorbed; because it appears (see chap. i. p. 126.), that the perspirable matter retained, as well as what is absorbed from moist or unwholesome air, is, though a general, only a remote cause of the scurvy; and not what may be called the *causa proxima*, as the last may in other epidemical and contagious diseases. Any person will be convinced of this who consults the best authors on that subject, *viz.* *Hoffman. de venen. in aëre contentis, epidemicorum morborum causis.* *Lancisus de nox. paludum effluviis.* *Ramazzeni constitutiones epidemicae.*

(m) *Vid. Sanctor. aph. 43.*

I come next to observe the other concurring causes which have so great an influence in disposing to this disease; such as laziness and indolence of disposition, and from thence a neglect of using proper exercise, or a sedentary and inactive life.

Every one, from experience, must be sensible how much exercise contributes to the health of the body, as well as to chearfulness of mind. It is necessary to keep up that due degree of firmness and tension in the solids, upon which the strength and soundness of a constitution depend: and which is acquired by such motions as increase the mutual action of the vessels on their contents, and each other. But the whole process of animal digestion, as well as all the secretions, depend upon this strength and firmness of the vessels and *viscera*. Whenever the tone of these is relaxed and weakened, which is most effectually done by keeping the body long at rest, or by neglect of due exercise, there must follow a deficiency in the vigour and strength of the powers of digestion; so that they will not be sufficient to concoct and elaborate the aliment, especially if it is of a too crude and viscid nature. And the whole system of solids being thus relaxed,
by

by reason of a deficiency of their action and efficacy, the chyle cannot be properly assimilated, nor the heterogeneous mass of fluids intimately mixed and blended: so that the body here is not duly nourished, nor the secretions rightly performed; especially that of perspiration, which exercise powerfully promotes. Hence the scorbutic *diathesis*, want of proper digestion, weak and relaxed fibres, with a stoppage of perspiration.

The same state of things will likewise occur in those who have been much weakened by a preceding fit of sickness; with this additional cause, that, besides the weakened tone of the solids, and of all the powers of digestion, there is often left in the constitution after fevers, an acrimonious state of the juices. Here such a diet is necessary to prevent the scurvy, as is adapted to the weakness of the organs, as requires the gentlest action of the *viscera* to concoct and assimilate it, and the smallest force to forward it in its passage, and is of a quality proper to correct the acrimonious disposition of the humours.

These being the predisposing causes of this disease, it plainly appears, that the effects produced by them, are, a relaxation of the tone of
the

the animal fibres; a weakening of the powers of digestion, together with a stoppage of perspiration. This last particular may receive confirmation, by observing, that some of the passions of the mind, as fear and sorrow, which have been assigned as causes of the scurvy, and are almost constantly its effects, act with the same remarkable influence on perspiration, as they were found to have on this disease in Lord *Anson's* crew (*n*). But as the mechanical effects of these passions upon the human body would require too long a discussion for this place, I shall refer it to the authors who have expressly treated of them (*o*).

I proceed to observe what farther effects are produced by what has been assigned as the occasional cause of this disease, *viz.* a gross and viscid diet in such circumstances as have been described, and the want of fresh greens or vegetables, which are found so effectually to check the scorbutic virulence.

I imagine it would be unnecessary to insist

(*n*) Compare *Sanct. apb.* 456. 458. 460. 461. 462. 463. 469. 474. 478. with Lord *Anson's* voyage, p. 101. edit. 5.

(*o*) Vid. A medical dissertation on the passions of the mind; and *Robinson* on the food and discharges of human bodies, p. 77.

long in shewing how, in the unavoidable hardships that sometimes attend seamen in long voyages, or the besieged shut up in towns; as likewise in times of scarcity or famine, or when people at any time use putrid flesh or fish, mouldy bread, or unwholesome waters; how, I say, from such corrupted substances, the scorbutic taint might probably be induced in the body. The aliment is never so far divested of its original qualities by digestion, as not to carry some of them along with it into the blood. I am indeed inclined to believe, that where the predisposing causes already mentioned are wanting, such putrid and corrupt aliment would occasion other diseases different from the scurvy. Though it may tend to increase it, and often concurs with other causes at sea to render it highly virulent; yet it is certain, the scurvy appears most frequently where such food has no share in breeding it, however generally it has been accused; its most common occasional cause being the gross viscid diet before described (*p*). In order to understand the effects of which, it may be proper to premise some observations on the nature of digestion in general, and the different changes

(*p*) Chap. i. p. 119.

our aliment must necessarily undergo, in order to fit it for the various purposes of life.

By the first process of digestion in the mouth, stomach, and intestines, the food must be rendered quite fluid; otherwise it can never pass into the blood, through the exceeding fine, and almost imperceptible lacteal vessels. For which purpose it is broken and divided by the teeth; farther subdued, macerated, and dissolved, by the heat, moisture, and various actions of the stomach, intestines, *viscera*, &c.; diluted by watery liquors, dissolved by others that are saponaceous, till, in the nature of a fluid chyle, it is received into the lacteals. What is unconquerable by these first powers of digestion, is thrown out of the body by stool. After it has in this liquid form entered the blood, it seems but little changed; retaining still a vegetable character, and resembling the nature of milk, in colour as well as other qualities; all animals being thus nourished, as it were, with their own milk. It therefore requires a still farther and more perfect elaboration, in order to animalise it, and fit it for the important uses of nutrition and perspiration.

To nourish the fluids, is to replace a liquor of the same kind and quality with that which

is gone. And as they are the thinnest parts of the fluids which are continually lost, so the aliment must be reduced extremely thin and fine to restore them. It must likewise be greatly attenuated, so as to pass through the most minute canals of the body, in order to adhere to, and repair the wasted solids. *Lastly*, It must still be more subtilised, before it can pass off, in the form of a volatile and insensible steam, by perspiration.

Thus, the nourishment both of the solids and fluids, and the matter of insensible perspiration, are all furnished from the aliment, that is, from the finest parts of the chyle, elaborated to an extreme degree of subtilty and perfection, and converted into the peculiar nature of the juices of our body, by the action which is called the *second concoction*. What cannot, by the powers of this action, be thus duly digested and assimilated, as in the former concoction the recrements were thrown off by stool, must here pass by urine. It requires a much stronger force of digestion, and a much longer time, to convert the chyle into nourishment, or into perspirable matter, than to pass it off crude by urine. In this way great quantities of liquor are soon passed. But for some
time

time after eating, the perspiration is always lessened, and is very small, whilst the white chyle is circulating, unsubdued, in the blood (*q*). It is certain, that many sorts of gross and viscid aliment, though they may pass the first concoction, are yet unconquerable by the subsequent powers, so as to furnish proper matter either for nourishment or perspiration.

From what has been said, the nature of aliment proper for these purposes may be understood; as likewise how it is fitted and prepared for these uses, both without and within the body. Thus, whatever method of art or cookery, by macerating, boiling, stewing, fermenting, &c. destroys the viscidty and cohesion of its parts, or renders it thinner and more fluid, performs part of that digestion which it necessarily must undergo in the body. By these means, in many cases an aliment may be furnished, ready prepared, of suitable and similar qualities to the chyle or humours of our body, and which requires but a small force to convert it into nourishment; being at once miscible with the blood, and all the rest of our humours. Of this nature are light thin broths, fermented bread, tender herbs and roots boiled, &c.

(*q*) *Vid. Lower de corde, p. 243.*

Such food is most proper for children, valetudinarians, and those who have any where a defect in their digestion. Hence likewise we may know how the concoction of aliment is promoted in the first passages, by diluting, saponaceous, and attenuating liquors; and by aromatic, bitter, and bilious medicines; and what is particularly requisite for its farther elaboration afterwards, *viz.* muscular motion, exercise of the whole body, strong fibres, the action of the lungs, and a good air.

I observed elsewhere (*r*), and it will appear to follow from what has been said, that all general rules or precepts which can be given for diet, are to be understood only as relative to the constitution or state of the body at the time. In particular, the viscidty and tenacity, or the solidity and hardness of food, in all animals, ought to be proportioned to the strength of their vital powers of digestion. I mean by these, the whole collected powers or faculties of the body, by which it assimilates into its own animal nature, various sorts of aliment. Such aliment as is too hard for these powers can never be sufficiently broken or dissolved, and when its tenacity exceeds this force of

(*r*) P. 116.

digestion, it can never be rightly converted into nourishment.

I proceed to apply this doctrine, and to consider more particularly the nature and qualities of such food as is truly the occasional cause of the scurvy, *viz.* a diet of dried or salt flesh or fish, together with the grosser farinaceous substances unfermented.

It is observable, that the tenderer or softer flesh is made by keeping for some time without salt, it is found to be the easier of digestion: but by being long hardened and dried with salt, its most fine, subtile, and nutritious parts, either fly off, or are fixed. Experience shews, that flesh long salted is of very difficult digestion. It requires perfect health, together with exercise, plenty of diluting liquors, vinegar, and many other correctors, to subdue it in the first passages. And, after all, it will afford a too gross and unconquerable chyle, where there is a defect in the organs of sanguification, or those of the second concoction. The nourishment we receive from animal substances, or what passes into our blood, seems chiefly to be the gelatinous or lymphatic part; the fibres being indissoluble, even in the first passages, and from thence are passed by stool. Together with
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which, part of the animal oil, or the fat of the meat, likewise enters the lacteals. This lacteal when long kept, even salted, is almost always rancid, especially that of pork. And as all the nutritious particles are here intimately intangled with sea-salt, this salt cannot, without difficulty, be extricated from them by the powers of the body. Hence such gross, sharp, and saline food, is rendered improper, in many cases for that thin, soft, mild nourishment required.

The next part of diet to be considered, is the farinaceous substances unfermented, *vis* sea biscuit, pudding, &c. It is certain no thing can be more wholesome than the meal-seeds of several plants, as wheat, barley, rice &c.; as also several of the *legumina*: and for this reason, because an oil seems necessary to the composition of the animal emulsion; and these in particular contain a vegetable one, of mild and friendly qualities to the human body. They afford so wholesome a nourishment, that they are used by the generality of mankind for the greatest part of their food. But some of these substances, in particular wheat-flour (which is most commonly eat by the *Europeans*), requires a previous fermentation, in order to break the glutinous viscosity which it acquires.

quires, by being mixed with water, and thus to subdue, out of the body, the mucous tenacity of its oils, and make them more miscible with the different humours; which, otherwise, people in the best health, and with the strongest force of digestion, find a difficulty in doing. Few can live altogether on ship puddings, dumplings, or the like, without being sensible of an oppression and uneasiness. But especially weak and exhausted people cannot well receive the necessary nourishment from such species of the mealy substances, until their *lentor* or mucosity is subdued by fermentation, or by some other method, by which they become lighter food. It is plain, that such a glutinous and viscid chyle as is afforded by hard sea biscuit, dumplings, ship-puddings, &c. requires the most perfect state of organs in the subsequent concoction for its farther elaboration (*f*).

Hence

(*f*) It may be said, That as fresh flesh and fish are much more apt to become putrid out of the body than dried and salt flesh and fish, the latter ought not to produce the scurvy; and the vegetables do not putrify so soon as animal food does; and the less they are animalised, the less putrescent they become. This only proves how little we can learn of the effects of food and medicines in the body, by experiments made out of it. In a deep scurvy, there is the highest degree of putrefaction which a living animal can well subsist under: yet if we were so lucky as to find
out

Hence the effects of the above diet constantly used, are twofold.

1st, Chyle is by this means wanting of proper quality to dilute and sweeten the acrimonious animal juices, to correct the putrescent tendency of the humours, and to repair the decay of the body. We find, that such a gross, rosy, and viscid chyle, cannot in scorbutic cases, be rightly incorporated with the blood, or converted into nourishment. And this weakness of digestion, or want of assimilation of the aliment in such persons, (but considering the effects produced by the predisposing causes of their malady), will appear to be more owing to a fault in the organs of sanguification, than in the first concoction. These are much weakened, commonly by want of exercise, often by preceding sickness, and always by the universal lax state of their fibres. But especially, as the chief predisposing cause of this disease is a moist damp air, the action of the

out the most powerful antiseptic in nature, it is not probable that scurvy could be thereby cured; although the body, after death, might be preserved by it as long as an *Ægyptian* mummy. On the contrary, the most putrid scurvies are daily cured by what quickly becomes highly putrescent out of the body, *viz.* broths made of coleworts and cabbage. However contradictory to some modern theories these facts may be, the truth of them is undeniable.

lung

ings, the principal organ of sanguification, thereby impaired and weakened. It is rendered imperspirable, as we shall more fully see afterwards. Gross viscid aliment, though it may be subdued in the first passages, and divided by diluting it, so as to enter the lacteals; yet, like starch passed through a sieve, it unites again; and its viscous tenacity and *lentor*, from a defect of energy in the solids and vessels, can never be broken to a sufficient degree of fineness, to nourish the body; nor can it be perfectly assimilated with the other juices. Hence a tendency to a spontaneous putrefaction, from want of proper chyle and nourishment; and symptoms, as will appear afterwards, the same as in people starved.

But farther, this crude chyle not being either elaborated, or expelled the body, it must, by repeated circulations, and continuing long there, become acrid and putrid, together with the other juices.

2dly, The tenacity of such aliment concurs in scorbutic cases; where the perspiration is already lessened, in a manner altogether to stop.

Indeed such a diet naturally lessens it, without the concurrence of other causes: for a laudable perspiration can only proceed from a du-

ly-prepared and well-concocted humour, obtained from such aliment as is thin, light, and easy of digestion. The matter of perspiration is the last and most elaborated humour of the body: the perfection of which depends upon its being reduced to the most imperceptible tenuity, by a compleat and thorough elaboration in all the different concoctions it undergoes. Hence all gross indigestible aliment is found to be imperspirable. This all statical experiments confirm (*t*). The effects of such viscid imperspirable food are particularly described by *Sanctorius*: “Imperspirable food begets obstructions, corruption, lassitude, grief, and heaviness of the body” (*u*). These are the most remarkable scorbutic symptoms.

Upon the whole, the case of scorbutic people appears plainly to be a weakened and relaxed state of solids, with such a condition of the blood as naturally tends to that spontaneous putrefaction which proceeds from want of nourishment, (or a recruit of proper chyle to correct and sweeten the acrid putrescent juices) and from a remarkable stoppage of perspiration.

(*t*) *Ubi est difficultas coctionis, ibi tarditas perspirationis.*
Sanct. aph. 250.

(*u*) Aph. 262.

This is evinced not only from the known and certain effects of the causes which give rise to their malady, but it hath the evidence also of ocular demonstration. Their swelled œdematous legs, and spongy gums, denote the state of their solids; their fœtid breath, stools, urine, ulcers, and blood, the condition of their fluids; and their spontaneous lassitude, but especially their dry, rough, or pellucid skins, prove a stoppage of perspiration.

Now, in such a state, it may be asked, What is proper to be done? Their perspiration cannot well be restored by diaphoretics or sudorifics. For though warm draughts of *decoct. lignor.* give a momentary relief to such people, and in some few cases a crude humour may thus be pushed through the skin in so relaxed a state of solids; yet such a humour goes off generally, and more naturally, by urine. And there being here no proper matter fitted for insensible perspiration, a change into a drier and purer air is not sufficient to recover them. Nor can the lax solids be braced up to advantage, while the juices are corrupt and unsound, and assimilation and nutrition wanting: so that exercise, stimulants, bark, steel, and astringents, will not cure them. Nor will a diet of even fresh flesh

broths remove a high and virulent degree of this disease, without the assistance of green vegetables.

We are upon this occasion told a very remarkable story by *Sinopæus* (x). “ There are
 “ whole nations in *Tartary* who live altogether
 “ on milk and flesh. These people are
 “ never seized with the small pox; but, on the
 “ other hand, are subject to violent scurvy
 “ which at times sweep off as great numbers as
 “ the small pox does of other nations.” He
 had four of them (two men, and two women who had been taken prisoners) in the hospital at *Cronstadt*, in the year 1733. The scurvy being epidemic there that spring, these poor people became afflicted with it, fell into profuse hæmorrhages, and every one of them died.

This leads me to inquire into the virtues of fresh green vegetables, which seem so necessary to correct the bad qualities of other dry and hard food, and are experienced so effectually to prevent, and often cure this distemper.

Recent vegetables, fresh plants and fruits are of a more tender texture than animals; and their parts being more easily separable, by reason of the less force of their cohesion, and

(x) *Parerg. medic.* p. 311.

lesser tenacity of their cementing *gluten*, they yield more easily to the dividing powers of our organs. They also contain less oil than either flesh or the farines. But gross oils (especially of the animal kind) seem not only to be the most unconquerable part of aliment; but, where there is already a corruption in the human body, may be apt, by becoming rancid, to acquire the highest and worst degree of it.

As these are the most necessary and requisite qualities in the present case, so perhaps by no other can all green fresh vegetables be characterised. There is no other particular virtue in which they all agree; a greater diversity of qualities being found in vegetable than in animal substances. But, besides what has been mentioned, vegetables have great and peculiar virtues in this disease, arising from a combination of various qualities; of which all vegetables possess one or more, in a higher or lesser degree; and do from thence accordingly become more or less antiscorbutic. The best remedies are furnished from a composition of different plants, most eminent for the properties required: and whatever simple possesses the most of these qualities, is, of all such, the most serviceable and
efficacious

efficacious for preventing and curing the malady.

It is to be remarked, that, in most properties here requisite, vegetables differ from animal substances. That there is a considerable difference in the constituent principles of vegetables and animals, is plainly proved by their chemical analysis. In the latter, the salts are found to be more volatile; and, by a great degree of fire, a volatile alcalescent salt is obtained from them: whereas a fixed alkaline salt is found copiously to abound in most vegetables when burnt; and indeed this last is properly of vegetable extraction.

But, without this chemical torture, which shews so great a diversity in their component parts, many plants are of an acescent quality whereas animal substances, on the contrary are almost all of an alcalescent, or perhaps rather a putrescent nature. It would indeed appear, that man, both from the structure of his organs of digestion and appetite, was designed to feed both on animal and vegetable substances. But though we perceive a person in health, and of a sound state of body, has a wonderful faculty of converting almost all sorts of alimentary substances into nourishment at times; yet
experience

experience shews, that no man can long bear diet entirely of flesh and fish without nauseating it, unless corrected by bread, salt, vinegar, and acids; and that for the reason before observed, *viz.* because the intention of digestion in the first passages is to draw from the aliment a milky, sweet, white liquor, resembling in quantity a vegetable emulsion; not indeed acid, but acetous; contrary to the nature of animal substances, which are observed in like circumstances to become putrid. And for this and other reasons (*y*), a mixture of vegetable substances seems requisite towards the composition of good chyle, and to correct the continual putrescent tendency of the animal humours.

(*y*) *An. Cocchi*, present Professor of anatomy at Florence, in his elegant academical discourse on the *Pythagorean* diet, among other things observes, *Ciò che deve pienamente persuadere ogni giusto pensatore della salubrità e potenza del vitto vegetabile, si è il considerare gli orrendi effetti dell' astinenza da un tal vitto, se ella non è brevissima, i quali s' incontrano amplamente e sicuramente registrati nelle narrazioni più interessanti e più autentiche degli affari umani. Le guerre, e gli assedi delle piazze, e i lunghi castrensi soggiorni, le lontane navigazioni, le popolazioni de' paesi incolti e marittimi, le famose pestilenze, e le vite degli uomini illustri, somministrano a chi intende le leggi della natura, incontrastabili evidenze della malvagia e velenosa attività del vitto contrario al fresco vegetabile.* P. 65.

Freschi vegetabili ho sempre detto, perchè i secchi anno quasi tutte le incomode qualità de' cibi animali, massime essendo le loro particelle troppo fortemente coerenti terrestri ed oleose. P. 49.

Thus

Thus one quality entering the most perfect antiscorbutic composition, is that of a vegetable acescency. Hence milk of all sorts is experienced to be of great benefit in this disease, being a true vegetable emulsion of different herbs fed upon by the cattle. And acids of any kind are found useful; such as vinegar, spirits of salt and vitriol; though far from being sufficient either to prevent or cure the scurvy, as wanting some other properties much more necessary than acidity.

If it be said, That scurvy-grass, cresses, and other acrid alcalescent plants, are found highly antiscorbutic; it must likewise be remembered, that they are not perhaps altogether so efficacious as the acescent fruits; or at least become much more so by the addition of lemon-juice, oranges, or a little sorrel; which last the *Greenlanders* (z) are taught by experience to join with them for their cure: *the chief and most essentially requisite quality* in the antiscorbutic composition, *viz. a saponaceous, attenuating, and resolving virtue*, possessed by such acrid vegetables in the most eminent degree, being thereby heightened, improved, and exerted in its full force.

(z) See chap. 5.

Soap is a mixture of oil and salt; by means of which various substances are brought intimately to mix together, and to incorporate, which otherwise they would not do. And whether the salt be acid, alkaline, or neuter, it is found to have this property. Soap is likewise a powerful attenuant of viscid substances; for which purpose something saline is always required. Now, in this characteristic, all succulent plants, roots, and fruits agree; and whether their salts be of an ammoniacal or nitrous quality, the composition in all is truly saponaceous.

It has been observed, that water alone may, by its intervention, dilute, and keep asunder for a while, the parts of viscid and gross food; and that in this manner they may even pass the lacteals: but, upon coming again into contact, they naturally will cohere. Now, this tenacity is best destroyed by vegetable soaps, and the juices of such herbs and fruits as are of an attenuating and resolving quality. We find, that, by the immoderate use of summer-fruits, the whole humours of the body may be melted down. Hence *diarrhæas, cholera morbus,* &c. so frequent at that season. But though the abuse of them proves so hurtful, yet they were certainly designed for the benefit of man-

kind. And in the present case they become eminently serviceable, from their salutary composition. They consist of a great quantity of water, whereby they dilute; of mucilaginous parts, by which they obtund the stimulating, putrefactive acrimony; and of a fine penetrating salt, antiseptic in the human body.

Moreover, as, by the scorbutic putrefaction the *crasis* of the blood was broken and dissolved, these give a homogeneous and saponaceous quality to the whole mass. At the same time they prove greatly aperient, in scouring and cleansing the furred and obstructed passages of the machine, especially the different emunctories. And thus the acrimony first blunted by these soaps, is expelled the body (*a*).

The chyle, by their means likewise, being imbued with a saponaceous and diluting quality, is now rendered miscible with the other humours, and fitted for the uses of nourishment and perspiration. Accordingly, we constantly experience good effects in this disease from whatever subdues the viscosity of the chyle, and makes it more saponaceous; as e

(*a*) They generally, upon first using, open the belly, promote urine plentifully, and restore perspiration; but if voraciously eat, induce a dangerous flux of the belly.

green soap itself, honey, but especially *oxym. scillit.* or pills made of soap and squills; and likewise whatever, as *Sanctorius* observes, either perspires itself, or assists the perspiration of other food; as most of the acrid antiscorbutics. And for this purpose he recommends some of the best of them, *viz.* onions and garlic (*b*), le (*c*), wine moderately used (*d*); and in particular well-baked bread (*e*). These, according to his remarks, not only perspire freely themselves, but by promoting the concoction and assimilation of grosser foods, fit them also for this secretion.

Lastly, There is another property peculiar to many green vegetables, and especially to the superfruits, which are found so beneficial here; and it is, that fermentative quality, by which they are preserved longer from corruption, both without and within the body. For whereas flesh and animal substances, without any other intermediate state, tend directly to putrefaction; vegetables are preserved longer from it by a fermentative tendency, which many vegetable juices naturally have, or may acquire by the addition of a proper ferment. We evidently

(*b*) *Aph.* 283.

(*d*) *Aph.* 369.

(*c*) *Aph.* 282.

(*e*) *Aph.* 210.

see in this disease the good effects of spruce beer, cyder, ale, wine, and other vinous liquors, prone to fall into this state in the stomach; on the contrary, the pernicious effects of distilled spirits, which check such a fermentation. And I am of opinion, for several reasons, that this is some how necessary to the perfection of animal digestion.

In a situation similar to that of the stomach with regard to heat, moisture, and air, many substances must naturally fall into a fermentation. We are certain by their effects, that ripe fruits and some vegetables cannot well be prevented from it, and actually do often ferment in the stomach: and observing, that, in the scurvy (*f*), and some other diseases, food of this tendency is requisite, and that abstinence from it is prejudicial; hence we conclude, that this operation, and food which tends to promote it, is necessary to digestion and to prevent the scorbutic corruption.

(*f*) *Kramer* observed, that in a thousand patients he had cured by the juices of scurvy-grass and cresses, each dose of the juices occasioned prodigious belchings and wind. It was so common, that he imagined it proceeded from the active and volatile salts of the herbs set loose in the stomach; to which he ascribed their cure. He therefore strictly enjoined his patients to prevent as much as possible these salts from making their escape.

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The fermentation here is certainly never completed: but the effects of a beginning fermentation are still very powerful, though soon stopt; as will appear to those who are acquainted with the surprising effects of the subtile imperceptible *gas*, which is set free from such substances in this act.

As animal digestion is a process *sui generis*, which no chemical operation has been found to imitate; none being able to convert food into chyle, or that into blood; all we can infer from experience, is, that in certain cases, as in the scurvy, vegetable juices and fruits of this tendency are found necessary to preserve health and life. If flesh, or animal substances, promote this process in the stomach, as would seem by some late experiments (*g*); we may from thence fairly conclude, flesh-soops stuffed with vegetables to be eminently antiscorbutic, which daily and incontestable experience sufficiently confirms.

Upon the whole, it follows, and will be found true in fact, that the more any food, drink, herbs, or medicine, partake of any of the aforesaid qualities, the more antiscorbutic they become; but that the most perfect and

(*g*) *Pringle's* experiment 35.

effectual

effectual remedies are found in a composition of different ingredients, each possessing in a high degree one or other of those virtues from the combination of which, a vegetable saponaceous, fermentable acid may result. Such an acid, ready prepared, is to be had in a certain degree in oranges, and most ripening sub-acid fruits; from whence they become the most effectual preservatives against this distemper.

C H A P. VII.

Dissections.

THE appearances in scorbutic dead bodies, are here distinguished under different numbers, for the convenience of making proper references to them in the following chapter.

N^o 1. contains the observations made by Lord *Anson's* surgeons upon the blood of their patients, and upon the dissection of dead bodies, in the several stages of this distemper at sea. N^o 2. a dissection made upon one of *Faques Cartier's* crew (*a*). N^o 3. to 21. *inclusivè*, is

(*a*) See Part 3. chap. 1.

Mr *Poupart's* account of many, and very accurate dissections of scorbutic bodies, in the hospital of *St Lewis* at *Paris*, in the year 1699 (*b*). It will admit of no doubt, that this last was a true scurvy, as it proceeded from the same causes, *viz.* long want, improper food, grief, melancholy, cold, &c.; and the symptoms were entirely alike with those in Lord *Anson's* crew; such as gums monstrously putrid, swelled legs, livid blue spots and hardness on the body, contracted limbs, the scorbutic *deliquium*, often ending in the most sudden and unexpected death, fluxes and hæmorrhages of all sorts, &c.

N^o 1. In the beginning of the disease, the blood, as it flowed out of the orifice of the wound, might be seen to run in different shades of light and dark streaks. When the malady was increased, it ran thin, and seemingly very black; and after standing some time in the porringer, turned thick, of a dark muddy colour; the surface in many places of a greenish hue, without any regular separation of its parts. In the third degree of the disease, it came out as black as ink; and though kept stirring in the vessel many hours, its fibrous parts had

(*b*) *Etranges effets du scorbut arrivez à Paris, par M. Poupart.*
Memoires de l'academie des sciences 1699, p. 237.

only the appearance of a quantity of wool or hair, floating in a muddy substance. In dissected bodies, the blood in the veins was entirely broken, that, by cutting any considerable branch, you might empty the part to which it belonged of its black and yellow liquor; and when found extravasated, it was all of the same kind. *Lastly*, As all other kinds of hæmorrhages were frequent at the latter end of the calamity, the fluid had the same appearance as to colour and consistence, whether it was discharged from the mouth, nose, stomach, intestines, or any other part.

2. The heart was found white and putrid; its cavities were quite full of corrupted blood. The lungs were blackish and putrid; more than a quart of reddish water was found in the *thorax*. The liver was pretty sound; but the spleen somewhat corrupted, and rough as if it had been rubbed against a stone.

3. All those who had any difficulty of breathing, or their breasts stuffed or stopped up, had there a quantity of serosity; and we found more or less of it according as they were oppressed.

4. The breast, belly, and several other parts of the body, were filled with this lymph or
serum;

serum; which was of different colours; and so corrosive, that having put our hands into it, the skin of them came off, attended with heat and inflammation.

5. We have seen some whose breast was so oppressed, that they died all of a sudden. In the mean time, we found no serosity, neither in their breasts nor in their lungs. But the *pericardium* was entirely fastened to the lungs; and the lungs were glued to the *pleura* and *diaphragm*. All the parts were so mixed and blended with each other, that they made up but one mass or lump, so confounded that one could scarce distinguish one from another. As the lungs were squeezed together in the midst of this mass, they were deprived of their motion, and the sick person was choked for want of breath.

6. All they who died suddenly, without any visible cause of their death, had the auricles of their heart as big as one's fist, and full of coagulated blood.

7. We have seen several, who without pain dropped down dead. They had no apparent sickness; only their gums were ulcerated, without any spots or hardness on their skin: yet we found their muscles were gangrened, and

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stuffed

stuffed with a black corrupted blood; and upon handling them, they fell to pieces.

8. A youth of ten years had his gums much swelled, and deeply ulcerated; his breath intolerably stinking. The surgeon was obliged to pull out all his teeth, for the better dressing of his mouth. There appeared afterwards ulcers upon his tongue and cheek. He died all of a sudden, and his bowels were found corrupted.

9. Some with no other symptoms but slight ulcerations of their gums, had afterwards small red hard tumours on their hands, feet, and other parts of their body: after which there appeared imposthumes in their groin, and under their arm-pits, together with blue spots on their body. We found the glands under their arm-pits very big, and surrounded with matter as well as the muscles of their arms and thighs whose interstices were all filled with it.

10. We observed some whose arms, legs and thighs, were of a reddish black. This proceeded from that black and coagulated blood which we always found under the skin of those persons.

11. We also found their muscles swelled and hard. This was occasioned by blood fixed in the body of the muscles, which were sometimes full

full of it, that their legs remained bent, without being able to extend or stretch them out.

12. The blue, red, yellow, and black spots, which appeared on the body, proceeded purely from extravasated blood under the skin. As long as the blood kept its red colour, the spot was red; if the blood was black and coagulated, the spot was also black, &c.

13. We sometimes observed certain small tumours, which, upon breaking, formed scorbutic ulcers. They proceeded from the blood, with which the tumour was filled: for as often as we took off the plaister, we still found under it a great deal of coagulated blood.

14. Some old persons had such large bleedings from the nose and mouth, that they died of them. The coats of the vessels were corroded and eat through by the sharp and corrosive humour.

15. In some, when moved, we heard a small grating of the bones. Upon opening those bodies, the *epiphyses* were found entirely separated from the bones; which, by rubbing against each other, occasioned this noise. In some we perceived a small low noise when they breathed. In those the cartilages of the *ster-*

num were found separated from the bony part of the ribs.

16. All those in whose breast any matter of serosity was found, had their ribs thus separated from the cartilages, and the bony part of the rib next the *sternum* carious for four finger breadth.

17. There were some dead bodies, in which if we squeezed, betwixt two fingers, the end of the ribs which began to be separated from the cartilages, there came abundance of corrupted matter. This was the spongy part of the bone so that, after squeezing, there remained nothing of the rib but the two bony plates.

18. The ligaments of the joints were corroded and loose. Instead of finding in the cavities of the joints the usual sweet oily mucilage, there was only a greenish liquor; which by its caustic quality, had corroded the ligaments.

19. All the young persons under eighteen had in some degree their *epiphyses* separated from the body of the bone; this water having penetrated into the very substance of it.

20. In scorbutic people the glands of the mesentery are generally obstructed and swelled. Some of these were found partly corrupted and imposthumated. In the liver of some few, the
matter

matter or corruption was hardened, and, as it were, petrified. Their spleen was three times bigger than natural; and fell to pieces, as if composed of coagulated blood. Sometimes the kidneys and breast were full of impostumes.

21. What was very surprizing, the brains of those poor creatures were always found and entire, and they preserved their appetite to the last.

C H A P. VIII.

The nature of the symptoms, deduced and explained from the foregoing theory and dissections.

THE symptom most commonly preceding the others in this disease, is a preternatural change of colour in the face. To explain this, it must be understood, that the solids in the human body are extremely small in proportion to the fluid parts; as appears plainly in cases of inanition and atrophies. But the colour of the whole body, especially the face, principally depends upon the nature and condition of the latter. We observe, a
small

small quantity of bile mixed with the blood tinges the whole surface of a living body; and a lucky anatomical injection will give any designed colour to that of a dead one. A natural and lively colour in the face denotes a well-conditioned, healthful, and homogeneous state of blood; such as is produced by the integrity of all the digestive powers, by the action of such good lungs, and elastic solids, as perfectly digest and assimilate the chyle into an animal nature. Paleness of the face, and a bloated complexion, are, on the contrary, signs of weakly fibres, and of a degeneracy of the humours from the aforesaid sound and healthy condition, into a crude and morbid state.

The chyle is white when it enters the blood; but if (as in scorbutic cases) it remains there unsubdued, by reason of its viscosity, and the weakness of the concoctive faculties, it undergoes different changes of colour, and from white becomes yellow, greenish, livid, &c. This will be visibly discovered in the countenance through the translucent vessels of the skin; where the least alteration of colour in the fluids is easily perceptible; especially when these vessels lie most exposed, in the lips, gums, caruncles of the eye, &c.

But this crude heterogeneous humour descending the vessels in an inert state of solids, will naturally either stagnate in the lateral capillaries, where with difficulty it can be propelled forwards; or be extravasated in the *tunica adiposa*, at the greatest distance from the heart, where the circulation is most languid, and a *nifus*, contrary to its own gravity, required to push it on; as in the legs, when in an erect posture. Hence such persons are observed to have œdematous swellings at first about their ancles, and on their legs. As the body becomes overloaded with a greater quantity of such crudities, these tumours increase; and other parts likewise, especially the face, becomes pale, swelled, and bloated.

Where the chyle is not assimilated, so as to nourish the body, the *moles movenda* is increased, (or a quantity of such humours is daily accumulated); mean while the *vires moventes* are diminished: the strength and vigour of our bodies being supported chiefly by well-digested food. Hence a lassitude, heaviness, and an aversion to exercise.

A sudden and remarkable prostration of strength is indeed observed constantly to attend
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all putrid diseases (*a*); of which this is the highest degree of the chronic kind. But in the case of scorbutic people, it is somewhat singular, and peculiar to them, that though when at rest they find themselves quite well; yet, upon the least exercise, they are subject, at first, to a panting and breathlessness; which, as the disease increases, degenerates into a proneness to faint; and, lastly, in the height of the malady, upon using exercise, or an exertion of their strength, or upon being exposed to a sudden change of air, they are apt to drop down dead.

In order to set this in a clear light, it must be observed, that although the scorbutic lassitude in general is owing to an obstructed perspiration; yet it does not so much proceed from the weight of four or five pounds retained in the body, (which might easily be carried about by any person, without uneasiness, or being felt) as from the *vires imminutæ*, or the relaxed state of their fibres. In like manner, the more peculiar symptoms mentioned, are produced by the effects of this obstruction, particularly in the lungs.

Perhaps it may be difficult to ascertain the

(*a*) Vid. Hoffman. de putredine.

exact quantity of perspirable matter sent off from thence (*b*). But it will appear to be a very great proportion, if we consider the vast extent of the perspirable surface of that organ, the watery vapour constantly emitted from it so visible in a cold air, and the just observation of *Sanctorius*, “That it is a sign of health, when, after ascending a steep place, the body feels lighter” (*c*); which would seem best explained, by allowing a freer circulation of the blood at this time through the lungs, when freed from perspirable matter.

But such a moist air as is productive of the curvy, is already replete with humidity: so that the moisture continually issuing from the lungs, cannot be absorbed by it. On the contrary, the wet external air is continually drawn into the vesicles; by which this bowel is oppressed, not only with its own natural moisture, but is kept as it were in a continual watery bath of external air. Hence it becomes overcharged with a ferous *colluvies*; its tone is consequently weakened, and some of its small-

(*b*) *Sanctorius* attempted it by breathing upon a glass: but *Dr Hales* has made more accurate experiments.

(*c*) *Aph.* 17.

er capillary vessels are necessarily compressed and obstructed.

When the body is at rest, the circulation is languid and slow: the blood then, in a small quantity, glides gently through the lungs, notwithstanding the obstruction in them. But when, upon using exercise, or an exertion of strength, the velocity of the blood is accelerated and a much greater quantity, *viz.* that which when at rest, was almost stagnating in the veins, is at once returned into the right cavities of the heart, and from thence into the lungs; the weakened and obstructed vessels of the lungs not being able so quickly to transmit so great a quantity, the blood is necessarily accumulated in the *sinus venosus*, right auricle and ventricle of the heart: which causes a breathlessness and panting; that is, an effort is made by all the powers subservient to respiration, to dilate the breath fuller and more frequently, for the passage of this increased quantity of blood.

This will receive confirmation by several considerations; as, that upon exerting a degree of strength, we hold in our breath; as also that the right ventricle of the heart is larger than the left ventricle, the *systole* of both is synchronous

chronous, and yet, what is singular, the pulmonary vein is less than the pulmonary artery.

But when the perspiration has been long obstructed by this damp air, which, as *Sanctorius* says, turns the perspirable matter into serosity, or an *ichor*, as he calls it (*d*), which is found to be truly the case in scorbutic people upon dissection (see chap. 7. N^o 2. and 3.), the passage of the blood through the lungs must still be more straitened. Hence, upon the least motion of the body, by which the circulation is quickened, and a greater quantity of blood sent at once into the heart, the heart becomes in such cases not able to overcome the resistance it meets with in forcing the blood through the lungs, as well as the weakened unelastic arteries. Whence, as before observed, the blood being accumulated, and stagnating as it were, in the cavities of the heart, there must follow an almost entire stoppage of the circulation for some time, a pause and cessation of the vital motions for a little; that is, the patient must faint away, till, by the exertion of the vital principle, and the heart being evacuated by the

(*d*) Aph. 146.

person's lying at rest, the circulation is again quickened, and he recovers (*e*).

Lastly, It appears by the weakness and feebleness of the pulse, and many other symptoms in this disease, as likewise from the known effect of putrefaction on animal bodies, by which the fibres are always rendered softer and tenderer, that the whole system of solids is in the most relaxed and weakened condition. Even the heart itself was found putrid, (N^o 2.) whose force to circulate the blood is not indefinite, more than its cavities, which can contain only a proportioned quantity. The first is certainly here greatly impaired; while the latter, or its cavities, were found preternaturally weakened and dilated, (N^o 6.). In this state such people are apt to drop down dead upon an exertion of their strength, or from exercise, but especially upon being exposed to a sudden change of air; that is, by removing them at once from the warm and moist air in the hold of a ship (*f*), into a colder, drier

and

(*e*) The swoonings of scorbutic persons are different from what happen to very weak and exhausted people in other diseases, upon being raised up. When they sit, they are quite hearty, and have a considerable degree of strength.

(*f*) The air in the hold of a ship is always moister than even upon

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and purer air. For the effect of this is, to constrict the whole external habit of the body, and to drive the blood at once with great force from thence towards the heart; at which time the velocity, as well as quantity of it, is increased in the internal parts. So that the heart is not able to overcome the resistance it meets with in the weak and unsound lungs, (whose vessels are also straitened by the contact of such fresh air); nor in the arteries, which will be in proportion to the quantity of blood with which they remain distended. But the weak unelastic arterial system is not here able to contract and propel the blood in their canals. On the contrary, the cutaneous vessels being thus constricted by the external air, the blood may perhaps have, as it were for an instant, a retrograde motion towards the heart, which this debilitated muscle (N^o 2.) cannot overcome. Hence such people drop down dead suddenly,

upon the upper deck. This is owing to the cables, and the other contents of the hold, not having a free circulation of air or wind, to dry up the water, either of the sea or rains, poured down upon them. Places below become also extremely moist, by the fresh water and beer spilt in pumping them from the casks, by the bilge-water, and by the cutaneous and pulmonary perspiration of a number of people pent up in the sick-apartment.

without

without any other visible cause of their death found upon dissection, (N^o 6.), than the weakened auricles of their heart aneurismatic, and distended with blood. They are observed to have a panting or breathlessness for about half a minute before they expire (*g*).

In Lord *Anson's* crew it was remarked, that a straitness of the breast, with an obstinate costiveness, was one of the most dangerous and fatal symptoms. Now, in this case, there was no relief to the breast, no evacuation to free it from the load of obstructed perspiration; part of which, no doubt, may be carried off by stool. Accordingly, where a derivation is made of the humours in scorbutic people by an open belly, their breasts are generally found much easier.

Of the same kind perhaps with the perspiration from the lungs, and external surface of the skin, is that moisture continually exhaling from all parts within the cavities of the body. It is at least supplied by the like means, *viz.*

(*g*) Why only the auricles of the heart in this case become aneurismatic, *vid. Lancif. de aneurismatibus in genere, prop. 52.* This species of sudden death is called by the great *Harvey*, *suffocatio ob copiam*; and is beautifully illustrated by his experiment, *Exercitat. 1. de motu cordis.*

from proper aliment (*b*). By it the bowels, and their cavities, are kept separate, and prevented from adhering to each other. This being wanting in some, proved likewise the occasion of their death, (N^o 5.); while in others the corrupted and putrified state of their body put an end to their lives, (N^o 7. 8. 9.).

I come now to account for the pathognomonic signs of this disease, *viz.* the putrid gums, &c. I shall upon this occasion observe, that although it is no easy matter to say why, in several general and universal disorders of the body, some particular parts are only or principally affected, while others, in such a state of almost universal corruption and putrefaction, as in the scurvy, continue to perform their functions as in health (see N^o 21.); yet we may hereby perceive the goodness of Providence, who, by certain signs peculiar to each disease, points out the malady, and gives us a medical and demonstrative certainty of its existence. But as this reasoning may appear too unphilosophical, I shall endeavour to account for these symptoms in the mechanical way.

The pathognomonic signs of the scurvy, which are putrid gums, a stinking breath, and

(*b*) Vid. p. 290.

loofening of the teeth, we find alfo in perfons who, by long fafting, are deprived of a fupply of frefh chyle. This confirms what I obferved before, that the ſcorbutic corruption is of that ſpecies which is the natural effect of heat and motion; the humours of the body, from want of a proper chyle to dilute and ſweeten them, becoming rank and putrefcent. In feveral orders of different religions, thoſe who are obliged, by way of penance, to abſtain a conſiderable time from food, perceive their breath become foetid, their teeth looſe, their gums ſpongy and ſoft (*i*). The ſame ſymptoms are alfo obſerved in thoſe who are ſtarved to death (*k*). In all thoſe, as well as in ſcorbutic caſes, theſe ſymptoms ſeem principally owing to the *ſaliva*; which, upon ſuch occaſions, becomes acrid. Every one's experience muſt convince him it is more ſo after ten or twelve hours abſtinence from food, than at other times.

But to underſtand more particularly why the

(*i*) I have always obſerved men of the rigorous orders in the church of *Rome* greatly ſcorbutic. They are remarkable for rotten gums, (part of which is commonly eat away), want of teeth, and a moſt offensive breath.

(*k*) *Vid. Tſchirnhaus. medicin. corporis, p. 23. Liſter de humoribus, cap. 12.*

gums

gums are principally, and often first, affected by this acrimony, it must be observed, that the vessels here lie very much exposed to the external air; which has a great effect in hastening corruption, to which the *reliquiæ ciborum* may contribute. At the same time their substance is the most tense and hard of any part of the mouth (*l*), and perhaps of the whole body. Now, by the acrimony of the blood, *saliva*, or other juices, we may be supposed to understand a change of figure in their particles; from being soft, blunt, and obtuse, to somewhat sharp, angular, and pointed. Hence the effect of acrimony on the human body is, to stimulate and irritate the parts.

Thus, in the gums, these acrimonious particles occasion at first an uneasy itching. But they are the most tense, and consequently the most elastic, of any other parts of the mouth. The oscillations or contractions of the very numerous vessels, therefore, will here proportionably be greatly increased; and thence action and reaction become in this place greater than in any other. The blood is consequently more moved, broken, and protruded even into the dilated lateral vessels, (according to the *Boer-*

(*l*) See *Winslow expos. anatom. de la structure du corps humain.*

haavian system); which in such a case will admit larger globules than can pass through their extremities. They therefore appear swelled, and distended with a livid blood; and in this state are apt to bleed upon the least friction of their tender dilated vessels. But the resistance of the solids being at last quite overcome, and their elasticity destroyed, the blood must stagnate in all the vessels; and, by stagnation and rest, of course becoming more acrid, corrode their coats, and bring on a general state of corruption and putrefaction on these parts.

The effects indeed of such acrimonious juices are felt universally in the body upon any increase of motion, and consequently of their force against the containing vessels; scorbutic people being most sensible of their pains upon motion or exercise of any sort, according to the known axiom, *Acrida nulla agunt si non moveantur.*

It was observed before, that the depending situation of the legs in an erect or sitting posture, particularly determined the humours to stagnation there, in the very beginning of the disease; which in the increase of it often become monstrously swelled. But such stagnating corrupt blood and humours are, upon the least rupture of the skin, apt to form into
 scorbutic

scorbutic ulcers. These generally occur upon the shin; where the least accidental squeeze makes a considerable bruise of the thin skin, against the hard and sharp spine of the *tibia*. Their appearance is truly described N° 13. and accounted for N° 10. and 11.

In such a state of blood (N° 1.) as appeared both in living and dead bodies, we have no reason to be surpris'd at the frequent hæmorrhages from all parts of the body, fluxes, dysenteries, &c. to which such people are subject; nor at its bursting out from the scars of old wounds in Lord *Anson's* crew. These are, for many reasons, liable to such accidents; not only from the hard and imperspirable *cicatrix* with which they are generally covered, but from a want here of the *tunica adiposa*, into whose cells the extravasated blood is poured, when it appears in spots on the body (N° 12.).

Putrefaction is found to be the most subtile of all dissolvents, powerfully separating and resolving the component parts of putrifying bodies; and in particular, breaking and dissolving the *crasis* of the blood. So that both here and in the plague, the spots appear altogether alike, as observed by *Diemerbroeck de peste*.

There is somewhat indeed singular in the

effects of the scorbutic acrimony upon the bones, (see N° 15. 16. but particularly 17.) ; whereby it appears to affect chiefly the internal cellular part, which is known to be of a different texture from the outward bony *laminae*. And from thence it is easy to account for those remarkable cases which occurred likewise in Lord *Anson's* Squadron, where the *callus* of broken bones, which had been compleatly formed for a long time, was found dissolved and the fracture seemed as if it had never been consolidated. It must be remembered, that the bones, like all the other parts of the body, are daily nourished and repaired by the aliment. There are many instances of entire bones being generated in the body anew. And it appears, that a *callus* is not (as has been vulgarly supposed) a rude glutinous mass, spued out from the extremities of the bones, by which they are glued together: but is really, like new flesh generated in wounds with loss of substance, a true organised part restored, of the same cellular texture with the other parts of the bone; with this difference, that it wants the outward bony *lamella* (*m*): so that, from this defect, it becomes, of all other parts of

(*m*) *Vid. Rusch thesaur. anatom. n. 8.*

the bone, most liable to be affected by the scorbutic taint.

Now, if the humours of the body, in the advanced stages of this malady, are capable of acquiring so corrosive a degree of acrimony, that, like a *menstruum*, they work upon and dissolve the cellular texture of the very bones, it is natural to suppose, that the nutritious particles are here so much depraved in the very beginning, or where there is only a scorbutic habit of body, that no *callus* can be formed; of which Dr *Mead* furnishes us with a remarkable proof (*n*). However, it is almost universally the case in the scurvy, as observed elsewhere (*o*), that as long as any bone is sufficiently defended by its external thick plates, it will not be found carious in this disease until broken and separated, (as in N^o 16. and 17.); so that the humour has access into the internal cellular substance of it. For this reason, it is rare to find a carious jaw, after the most virulent ulcers in the gums, unless by some accident, as the pulling out of a tooth, part of the *laminæ* of that bone has been broken. In the same manner, the teeth will likewise be

(*n*) Discourse on the scurvy, p. 107.

(*o*) Chap 2. p. 164.

preserved sound, if their outer coats are entire.

There is a reason assigned N^o 18. for the loss of motion which happens commonly to the joint of the knee in this disease. To which it may be added, that the lubricating liniment of the joints is said to be partly composed of the perspirable matter (*p*); which being here either deficient, or degenerated into a morbid state, may induce this symptom.

It likewise appears, that the oily mucilage that lubricates the hard tendons, and their sheaths, and which fits them for motion, is of a similar nature with the liquor found in the cavities of the joints (*q*). We have a proof of its extreme depravity in N^o 18; so that they must necessarily become hard, contracted, and unfit for motion.

It is indeed the universal perspiring humour, exhaling from all parts, both external and internal, of the body, which gives softness, pliancy, and suppleness, to the whole machine. And it is a deficiency of this which occasions hardness of the flesh, contraction of limbs, want of motion, and indurated tendons, in scorbutic cases.

(*p*) *Vid. Van Swieten comment. in Boerhaave aph. 556.*

(*q*) *Vid. Kaau de perspiratione, n. 854.*

Lastly,

Lastly, If we consider the other appearances observed upon dissection, *viz.* the swelled, obstructed, and putrid state of the *viscera*, (N° 20.); the rottenness of the heart itself, (N° 2.); in some the universal putrefaction of the body (*r*), (N° 7. 8. and 9.); the caustic acrimony of the lymph found in its different cavities, (N° 4.); with the condition of that vital fluid the blood, even when alive, (N° 1.), where its dark and livid colour, but especially the greenish hue, denoted the highest degree of putrefaction (*s*); we will have no reason to be surpris'd at the most extraordinary and anomalous symptoms, which sometimes have occurred in this disease.

The following letter from Dr *John Cook*, physician at *Hamilton*, was received too late to be inserted in its proper place.

I Here send you some brief remarks I made in general upon the scurvy in *Russia*, *Tartary*, &c. in all which countries it is an endemic and dreadful disease.

Taverboff lies in 52 deg. of N. Lat. where the

(*r*) *Bachstrom*, p. 20. observes, that the dead bodies of scorbutic people corrupt much sooner than others, and are attended with a remarkable *fætor*.

(*s*) See Dr *Pringle's* experiments, exper. 45. on putrified blood.

stream

stream of the *Verona* is received into the *Don*. It is situated, as most towns on the banks of that river, on a low sandy soil, and surrounded with lakes, marshes and woods. The winter commonly begins in the month of *October*. In *November*, all the rivers, lakes and marshes, are quite frozen over, and the whole country is covered with snow; which continues until about the beginning of *April*, O. S. At this time the snow suddenly melts away, leaving the earth covered with grass, and many wholesome vegetables. The spring is so very short, that the inhabitants are scarcely sensible of it; for in less than fifteen days the weather becomes excessive hot; and the cold frosty winter is suddenly expelled by a very warm summer that continues until the month of *September*; during which time the weather is very hot and moist. When I was there in the years 1738 and 1739, 27,000 boors were employed in cutting wood, and preparing it for building of ships for the use of the army; and also about 5 or 600 sailors, who were their overseers and between 2 and 3000 soldiers, who guarded the boors to prevent their making an escape. In the month of *February* 1738, the scurvy made its appearance. The boors were not so much afflicted with it as the sailors, nor the sailors so much as the soldiers. Many, both sailors and soldiers, were sent to our hospital this month; but their numbers were greatly increased in *March*. Towards the latter end of *April* they were mostly recovered, and many were discharged from the hospital. In *June* none remained except

cept the most inveterate cases. In *July* an intermitting, and an obstinate remitting fever, prevailed. From the 1st to the 20th of *August* we had but few patients. From that time to the 1st of *October*, agues raged with more violence than ever; and fluxes succeeded in *October*. This month the first snow fell; and at that time children were universally affected with sore throats. We had afterwards settled frosty weather, and but little sickness, except a few inflammatory fevers; until about the beginning of the year 1739, when the scurvy began to shew itself, much about the same time as in the preceeding year, and continued its usual length of time.

Astracan is situated in $46\frac{1}{2}$ deg. N. Lat. on a small island washed by the *Volga*. Here are many salt lakes, both upon the islands and desert. The garrison-soldiers are much more subject to the scurvy than the boors, and these last than the sailors. The soldiers live a very indolent life, having but little duty to perform. They eat hardly any thing else, even in their hospitals, besides rye bread and meal, with fish; and have nothing but water for drink, except the decoctions prescribed for them by the surgeons. Their hospitals are very damp and rotten. This poor garrison of five regiments, consisting of about 6000 men when compleat, is yearly recruited with between 600 and 1000 men. The boors live also but a lazy indolent life; being employed either in fishing, or in navigating great boats, from *Astracan* sometimes as far as *Tweer*. On the contrary, the sailors work hard,

at all times of the year, both in the docks and at sea and live much better, having good provisions of all sorts. The winter begins commonly in *October*, and continues till *March*. It is extremely severe during the months of *January* and *February*. The scurvy generally breaks out in the latter end of *February*. I found it here often complicated with other diseases viz. the *lues venerea*, agues, dropfies, *phthisis*, &c. The violence of the distemper (except in complicated cases) seldom continues after *June*, or to the middle of *July*.

Riga, the metropolis of *Livonia*, is the last place I shall mention. The winters are here very long. The soil for many miles about it is sandy and covered with many lakes, mosses, and morasses. The boors living better than they do in *Russia* and *Tartary*, are not so subject here to the scurvy as the soldiers in the army, nor these so much as the proper garrison; for by their labour they gain money and can purchase flesh in winter. The garrison-soldiers, consisting of between 6 and 7000 men, are most miserably lodged. The walls of their ill-contrived barracks are continually moist and warm. At *Riga*, in the years 1749 and 1750, but especially in the year 1751, the scurvy raged with the utmost violence. It broke out in the month of *February* that year. Here I saw the most dreadful spectacles that ever I beheld. Their rotten gums gangrened, as also their lips, which dropped off; the *sphacelus* spread to their cheeks, and muscles of their lower jaw; and the jaw-bone in some
fel.

fell down upon the *sternum*. When the mortification first began, we tried the bark, to no purpose. Nothing but death rid the unhappy wretches of their frightful misery.

Dr Nitzsch's method of cure (1) corresponds with, and is agreeable to the method practised in *Russia*, especially by the *German* physicians and surgeons. What he terms the *hot* or *painful scurvy*, is generally a complication of this disease with the pox. Although some may die in the state he describes, without having any outward swelling upon the body; yet such persons have always scirrhus swellings of the glands in the *abdomen*, particularly of the mesenteric glands, and of the liver, which are perceptible to the touch, even before death. My method of cure was in general as follows, unless some particular symptoms or cases required me to deviate from it. I commonly began with a very gentle purge or two, and then gave the *decoct. antiscorb. (u)*, and *essent. antiscorb.* At *Astracan*, we gave the juice of *rad. raphan.* mixed with a very little brandy, twice a-day. The patients had fresh flesh-meat every day, and what greens or salads we could procure them. They used the warm bath once or twice a-week. Before they eat, drank, or swallowed any medicines, their mouths were well gargarised with solutions of nitre, &c. Their gums were dressed with *ung. Ægyptiac. tinct. myrrh. tinct.*

(1) Vid. Part 3.

(u) I presume the Doctor means the *decoct. sum. pin. &c.* described by *Nitzsch.*

lacc. &c. I obliged them to use exercise, and to walk about both forenoon and afternoon, when the weather would permit. I allowed them to sleep moderately; and forbid them all dried, salt, and fat meats. Fumigating the wards, is common in all the hospitals in *Russia*.

When I came home to this country, I found the denomination of *nervous disorders* universally applied to most chronic and cachectic ailments. Upon examining those complaints in the lower sort of people who live entirely on the farines and a gross diet, I observed, they had a universal lassitude, pains which they termed *rheumatic* flying through their body and a breathlessness upon using exercise. The legs were sometimes swelled, and the *abdomen* almost always tense and tumified. But, whether they had swellings or not, they had generally an ill-coloured scorbutic complexion, and were listless and inactive to a great degree, with complaints of pains in their jaws, teeth, &c. I made no scruple to pronounce such cases scorbutic; and by proper antiscorbutic regimen, medicines, diet, and exercise, seldom failed to give very sensible relief. I have disobliged many patients by saying they had the scurvy; a disease as hateful as it is unknown in this part of the world: but the relief they obtained from antiscorbutics, soon convinced both them and myself, that their cases were not mistaken.

A
T R E A T I S E
O F T H E
S C U R V Y.

P A R T III.

C H A P. I.

Passages in ancient authors, supposed to refer to the scurvy; together with the first accounts of it.

THIS distemper, barbarously in the *Latin* denominated *scorbutus*, is said to derive its appellation from *schorbeēt* in the *Danish* language; or the old *Dutch* word *scorbeck*: both which signify a tearing or ulcers of the mouth. Most authors have deduced the term from the *Saxon* word *schorbok*, a gripping or tearing of the belly; which is by no means so usual a symptom of this disease; though, from a mistake in the etymology of the name, it has been accounted so by these authors. The word seems to me most naturally to be made out from *scorb* in the *Sclavonic* language, which signifies a *disease*; this being the endemic evil in *Russia*, and those northern countries, from whence we borrowed the name (*a*).

(*a*) *Vid. Hist. natural. Russiæ. Commerc. literar. Norimb. ann. 1733, p. 274.*

It is said to have been known and described by the ancient writers in physic under other denominations and particularly by *Hippocrates*, as the εἰλεὸς αἱματώδης, the third species of *volvulus* (b). He says, those who labour under that disease, have a foetid breath, lax gums and an hæmorrhage from the nose; ulcers sometimes on their legs, which heal up, while others break out anew. Their colour is black, their skin fine and thin; they are chearful, and prompt to action. He afterward adds, that it required a tedious cure, was with difficulty removed, and often accompanied the patient to his death. *Langius* was of opinion, that this contained a description of our modern scurvy. He imagined all the *lues venerea* to be nothing more than a complication of symptoms and diseases which had been before described by the ancients; to prove which he wrote two of his epistles (c). *Foësius*, *Dodonæus*, and some others would here willingly supply a defect, by putting in the particle *ι*. This would indeed quite alter the sense of *Hippocrates*, making the disease attended with an aversion to all sort of exercise, more agreeable to the true genius of the scurvy.

But the most prevailing opinion is, that, in different parts of his writings, *Hippocrates* has described the scurvy under the name of σπλῆν μέγας, a swelling and obstruction of the spleen. After having told us (d), that an hæmorrhage from the nose, in people otherwise seemingly healthy, presaged either a swelling of the spleen, pain in the head, or floating images before the eyes, he describes those with the swelling of their spleen, as having unsound gums, and a stinking breath. If these symptoms did not appear, they then had ulcers on the *tibia*, and black *cicatrices*. After mentioning some symptoms

(b) *Lib. de intern. affectionibus. Edit. Foësii, p. 557.*

(c) *Epist. 13. et 14.*

(d) *Prorrhetic. lib. 2. p. 111.*

which give reason to expect an eruption of blood from the nose, he adds another diagnostic, *viz.* a swelling under the eye-lids; to which if there be joined a swelling of the feet, they would seem to labour under a dropsy. He treats of this disease in another place (*e*); here he takes no notice of the gums being affected, but only of the breath being offensive; the patient's losing colour, being lean, and having bad ulcers. The spleen is hard, and always of an equal bigness, in those of a bilious habit; but in a pituitous constitution, it was sometimes bigger, and sometimes less. Several received small benefit from medicine, by which the swelling of their spleen was usually but little abated: and the disease not yielding to any remedies, some in progress of time fell into dropsies; but in others the hardness and swelling continued to old age. If it suppurated, they were cured by burning the part. He is elsewhere (*f*) still more particular in his description of that disease. In those who labour under it, the belly first swelled, then the spleen is enlarged, and feels hard, with acute pain. They lose their colour; become black, or pale, of the hue of a pomegranate rind; emit a disagreeable smell from their ears and gums, (the latter of which separate from the teeth); have ulcers on the *tibia*, extenuated limbs, and a costive belly. He attributes these swellings (*g*) to the drinking of stagnating, raw, and unwholesome waters; where he describes the *lienosi* as thin, meagre, and extenuated by the disease.

The reader will hereby be enabled to judge, or better by consulting the original itself, how far *Hippocrates* has described the modern scurvy under the appellation of *swelling of the spleen*. It appears by several passages

(*e*) *Lib. de affectionibus, p. 521.*

(*f*) *Lib. de intern. affectionibus, p. 549.*

(*g*) *Lib. de aëre, aquis, et locis, p. 283.*

in his works, that he imagined the yellow jaundice owing to an obstruction of the liver, and the black to that of the spleen, especially to a *scirrhus* of it. An obstruction or hardness of that *viscus*, as well as some parts contiguous to it, which he might easily mistake for, often occurs in practice; and is owing chiefly to such causes as he assigns (*b*), *viz.* ill-conditioned fevers, particularly of the intermittent kind; and, as he justly adds, is a disease not in itself mortal, though of tedious cure (*i*). But dissections have sufficiently proved, that in the scurvy the spleen is but seldom affected, or at least not the cause or seat of the disease. Dr *Mead* gives an instance (*k*) of a preternatural swelling of the spleen found after death in a countryman of the island of *Sheppey*, who had scorbutic symptoms. But it is to be remarked, the patient laboured under a complicated disease, especially a violent intermitting fever, which was often attended with obstructed *viscera*. That this disease was not known or described by *Hippocrates*, farther appears from his making no mention of spots, an usual symptom in the scurvy, nor of many others which almost constantly attend it. Upon the whole, we may be persuaded, that had this divine author seen the distemper, he, who studied nature with so much care, and copied her with so great exactness, would have left us a more accurate description of it. But the truth is, the warm southern climate in which he lived, was not the cause, nor is at this day, productive of it: and the nature of the coasting voyages of the ancients gave him no opportunity of being acquainted with it at sea. So that the

(*b*) *Lib. de intern. affection. p. 521.*

(*i*) This distemper is observed by my ingenious friend Mr *Cleburn* to be one of those to which the inhabitants of *Minorca* are subject, from their scarcity of well-water, and the frequency of tertian fevers in that island. *Observations on the epidemic diseases of Minorca, Introduction, p. 67.*

(*k*) *Monit. et præcept. medic. cap. 16. de scorbuto.*

seems no occasion for paying him a compliment here; as it is not to be expected he should have hinted at, much less have described a disease, which in all probability he never saw nor heard of. It must indeed have been a frequent malady, if it was the same as the enlarged spleen, which he so often and fully describes in his writings. If we might have expected it any where, it would have been in his account of the inhabitants of *Phasis* (1); where he compares the nature and make of the *Asiatics* with the *Europeans*, and accounts for the various constitutions, manners, &c. of different nations, from their particular soil, climate, and air. He describes the *Phasians* inhabiting a low, damp, marshy soil; living in wooden houses built upon the waters; reserving a communication with each other by means of ditches, upon which they were continually passing in boats made of hollowed trees. Their air was thick, moist, and impure; the waters they drank, stagnant and warm, corrupted by the sun, and supplied by the rains; which were there incessant and violent. Upon account of which situation, they differed from other men in their make; being in stature taller, and so corpulent, that their veins and joints hardly appeared; their colour was pale, inclining to yellow; they had a harsher voice than other nations, and were naturally slower to action. These are all the remarks he makes upon them, without adding any one scorbutic appearance, to which we would naturally have supposed them subject.

The succeeding *Greek* and *Roman* authors, are likewise upon this disease entirely silent. They copy from *Hippocrates* pretty nearly the account they give of the *lienosi*; without adding any one symptom which

(1) *Lib. de aëre, aquis, et locis.*

Phasis was a city in the ancient kingdom of *Colchis*, upon the easternmost side of the *Black sea*, between *Georgia* and *Circassia*, not far from the ancient *Sauromatæ*.

would induce us to believe, that either he meant, or they understood it to be the scurvy (*m*).

It also seems to have been a disease altogether unknown to the *Arabian* writers. They have made no mention of such a distemper in any part of their works, though *Avicenna* (*n*), the most considerable among them, has described the spleen-malady at great length with the same symptoms as done by the *Greeks*.

Some who are extremely fond of attributing much of the knowledge of the sage ancients, would have it to be the same with the *oscedo* described by *Marcellus* (*o*). *Poupart* thought the malignant scurvy observed at *Parthia* had a resemblance to the *Athenian* plague, as described by *Lucretius* (*p*). *Moellenbroek* imagined the servant of the centurion at *Capernaum* (*q*) to have had this distemper. But such opinions deserve no serious confutation.

It has, lastly, and with greater shew of reason, been esteemed the same malady which afflicted the *Roman* army under the command of *Cæsar Germanicus*. In order to judge of which, it may be proper to transcribe the narration as it is in *Pliny* (*r*).

(*m*) *Celsus*, in his elegant manner, almost literally translates *Hippocrates*.

Quibus sæpe ex naribus fluit sanguis, his aut lien tumet, aut capiti dolores sunt: quos sequitur, ut quædam ante oculos tanquam imagines versentur. At quibus magni sunt lienes, his gingivæ malæ sunt, et olet, aut sanguis aliquâ parte prorumpit. Quorum si nihil evenit, necesse est in cruribus mala ulcera, et ex his nigræ cicatrices fiant. Lib. cap. 7.

Ætius, tetrab. 3. serm. 3.

Paulus Ægineta, lib. 3. cap. 49.

Aretæus de causis et signis morborum, lib. 1. cap. 14.

Cæsar Aurelianus chronic. sive tardar. passion. lib. 3. cap. 4.

(*n*) *Can.* 3. fen. 15. tract. 2. cap. 5. de signis apostematum splenis

(*o*) *Lib. de medicamentis*, cap. 2.

(*p*) *Lib. 6. Vid. Thucyd.*

(*q*) See *Matth.* viii. 5.

(*r*) *Histor. natural.* lib. 25. cap. 3.

“ The Roman army under the command of *Cæsar Germanicus* having incamped in *Germany*, beyond the *Rhine*, near the sea-coast, they met with a fountain of sweet water; by the drinking of which, in the space of two years, the teeth dropt out, and the joints of the knees became paralytic (*s*). The physicians called the malady *stomacace* and *sceletyrbe*. They discovered a remedy against it, *viz. herba Britannica*, a salutary medicine not only in disorders of the mouth and nerves, but for the quinsy, bite of serpents, &c.”

The whole seems pretty extraordinary. And I cannot help remarking, that the loss of their teeth, and the use of their limbs, in two years after drinking this water; the extraordinary virtues ascribed to *herba Britannica*; and the romantic directions afterwards added of gathering it before thunder, favour much of that fabulous credulity for which this author is so justly blamed. But had a more credible historian given us this relation, it would still seem exceptionable, upon many accounts, as referring to the scurvy.

Those places beyond the *Rhine*, *viz.* the northern parts of the *Netherlands*, are now well known, and no such fountain has ever been discovered. No mention is made of scorbutic spots, which are more frequently observed than what has been here interpreted the *sceletyrbe*. This is supposed to refer to the rigid tendons in the ham. But his delineation by no means seems to express this peculiar symptom in the scurvy. It is understood by *Galen* (*t*), the only author who uses the appellation, to mean a species of palsy very different from the scorbutic contraction.

Strabo (*u*) mentions a like malady occasioned by the use

(*s*) *Compages in genibus solverentur.*

(*t*) *In definition. medic. p. 265. tom. 2. Ed. Charterii.*

(*u*) Στομακάκη τε καὶ σκελοτύρβη πειραζομένης τῆς σρατιᾶς ἐπιχωρίοις πάθει, τῶν μὲν περὶ τὸ σῶμα, τῶν δὲ περὶ τὰ σκέλη παράλυσιν τινα δηλόντων, ἕκ τε τῶν ὑφ' αὐτῶν, καὶ τῶν βοτανῶν. *Strabon. geograph. lib. 16. sub finem.*

of certain fruits, &c. to have afflicted the army under the command of *Ælius Gallus* in *Arabia*. But *stomacac* may justly be understood to mean various other disorders of the mouth, (aphthous, and other kinds), without supposing it to be the scurvy; as this calamity, when general in an army, occasioning the *sceletyrbe*, or depriving the soldiers of the use of their limbs, must needs have been attended with other concomitant symptoms, equally constant and remarkable in the disease (x). These would no doubt have been particularly described by the succeeding writers in physic, who had opportunity of seeing both *Pliny's* and *Strabo's* writings.

There would have been no occasion to have dwelt so long upon this inquiry, (as it may appear a matter of no great importance, to be rightly informed whether the disease was known to the ancients or not), if a misplaced esteem for their works had not been productive of its consequences on practice, and in the cure of this disease. Many, believing the spleen the seat of it, have adapted their medicinal intentions to the relief of that bowel while others have wrote whole volumes to discover the true *herba Britannica*, endued with such supposed miraculous virtues.

But as people are apt to run from one extreme to another, such has been here the case. Many not finding the disease in any description of the ancients, have supposed it a new calamity, making its appearance in the world, like the *lues venerea*, at a certain period of time (y) an opinion equally, if not more censurable than

(x) Not that I would be understood to mean, that the scurvy never afflicted armies of old; but only that the accounts we have of it are dubious and imperfect. The first description of a true scurvy that I have met with, is what occurred in the Christian army in *Ægypt*, about the year 1260, under *Lewis IX*. But there mention is made, not only of the legs being affected, but also of the spots. The fungous and putrid gums are particularly described, &c. *Vid. Histoire de Lewis IX. par le Sieur Joinville.*

(y) *Vid. Freind's history of physic.*

the former. For as there seem to have been two reasons principally why it is so imperfectly, if at all, described by the ancients, *viz.* their little knowledge of the northern countries, where it is peculiarly endemic, and their short coasting-voyages; so we find, that as soon as arts and sciences began to be cultivated among those northern nations, (about the beginning of the sixteenth century, a period remarkable for the advancement of learning over all *Europe*), this disease is mentioned by their historians and other authors. We could not have expected it sooner from their physicians, if we reflect upon their extreme ignorance, and the little esteem this science was held in by them (z). But when, after the taking of *Constantinople*, the *Greek* writings were dispersed over the western parts of the world, and in the beginning of the next century were made general and public by the late invention of printing, the art of physic began to flourish in the northern parts of *Europe*; and we soon after find this disease accurately described here by physicians.

In like manner, no sooner were long voyages performed to distant parts of the world, by the great improvement of navigation, and by the discovery of the *Indies*, which happened much about the same period of time, but the seamen were afflicted with it; as appears by the voyage of *Vasco de Gama*, who first found out a passage by the *Cape of Good Hope* to the *East Indies*, in the year 1497; above a hundred of his men, out of the number of a hundred and sixty, dying in this distemper. In the relation of which voyage, the first account of this disease at sea is to be met with (a). At that time, and for a considerable time afterwards, it was a disease little known; as appears by the following narration.

(z) *Vid. Olaus Magnum de medicina et medicis septentrionalibus.*

(a) See the history of the *Portuguese* discoveries, &c. by *Hernan Lopes de Castaneda*.

The second voyage of James Cartier to Newfoundland, & the grand bay up the river of Canada, ann. 1535 (b)

“ In the month of *December*, we understood that the
 “ pestilence was come upon the people of *Stadacona*
 “ and in such sort, that before we knew of it, above
 “ fifty of them died. Whereupon we charged them
 “ neither to come near our forts, nor about our ships.
 “ Notwithstanding which, the said unknown sickness
 “ began to spread itself amongst us, after the strange
 “ sort that ever was either heard of or seen; inasmuch
 “ that some did lose all their strength, and could not
 “ stand upon their feet; then did their legs swell, the
 “ sinews shrunk, and became as black as a coal. Others
 “ had also their skin spotted with spots of blood, of
 “ purple colour. It ascended up their ancles, knees,
 “ thighs, shoulders, arms, and neck. Their mouths
 “ became stinking; their gums so rotten, that all the
 “ flesh came away, even to the roots of their teeth
 “ which last did also almost all fall out. This infection
 “ spread so about the middle of *February*, that of
 “ hundred and ten people, there were not ten whole
 “ so that one could not help the other; a most horrible
 “ and pitiful case! Eight were already dead; and more
 “ than fifty sick, seemingly past all hopes of recovery.
 “ This malady being unknown to us, the body of one
 “ of our men was opened (c), to see if by any means
 “ possible the occasion of it might be discovered, and
 “ the rest of us preserved. But in such sort did the calamity
 “ increase, that there were not now above three sound
 “ men left. Twenty-five of our best men died; and all
 “ the rest were so ill, that we thought they would never
 “ recover again: when it pleased God to cast his pitiful
 “ eye upon us, and send us the knowledge of a remedy
 “ for our health and recovery.

(b) *Hakluyt's collection of voyages*, vol. 3. p. 225.

(c) See the dissection, Part 2. chap. 7: N^o 2.

“ Our Captain considering the deplorable condition of his people, one day went out of the fort, and walking upon the ice, he saw a troop of people coming from *Stadacona*. Among those was *Domagaia*, who not above ten or twelve days before laboured under this disease; having his knees swelled as big as a child’s head of two years old, his sinews shrunk, his teeth spoiled, and his gums rotten and stinking. The Captain, upon seeing him now whole and sound, was thereat marvellous glad, hoping to know of him how he had cured himself. He acquainted him, that he had taken the juice of the leaves of a certain tree, a singular remedy in this disease. The tree in their language is called *ameda* or *banneda* (*d*); by a decoction of the bark and leaves of which, they were all perfectly recovered in a short time.”

Of the colony sent over from *France*, under the Lord of *Roberval*, there died in the winter fifty in this disease (*e*). We have some time afterwards the following farther account of it.

Nova Francia; or, A description of that part of New France which is one continent with Virginia; in three late voyages and plantations, made by Messieurs de Monts, du Pontgrave, and de Poutrincourt (*f*), published by L’Escabot, ann. 1604.

“ Briefly, the unknown sicknesses like to those described by *James Cartier*, assailed us. As to remedies, there were none to be found. In the mean while, the poor creatures did languish, pining away by little for want of meats to sustain their stomach; which could not receive hard food, by reason of a rotten flesh

(*d*) See Part 2. chap. 4. p. 222.

(*e*) *Ann.* 1542. See *Hakluit*, vol. 3. p. 240.

(*f*) Collection of voyages and travels, compiled from the library of the late Lord Oxford, vol. 2. p. 808.

“ which

“ which grew and over-abounded within their mouth
 “ and when one thought to root it out, it grew again
 “ one night’s space, more abundantly than before. A
 “ to the tree called *amedá*, mentioned by the said *Ca*
 “ *tier*, the savages of these lands know it not (g).
 “ was most pitiful to behold every one (very few ex-
 “ cepted) in this great misery, and the miserable wretch
 “ dying, as it were, full of life, without any possibili-
 “ of being succoured. Thirty-six died; and thirty-
 “ or forty more stricken with it, recovered themself
 “ by the help of the spring, so soon as that comfort-
 “ able season appeared. The deadly season is the end
 “ of *January*, the months of *February* and *March*
 “ wherein the sick die most commonly, every one
 “ his turn, according to the time they begin to be ill
 “ in such sort, that he who is taken ill in *February* and
 “ *March*, may escape; but those who betake themself
 “ to bed in *December* and *January*, are in danger
 “ dying in *February*, *March*, or the beginning of *April*.
 “ Which time being past, there are hopes and assurance
 “ of safety. *Monf. de Monts* being returned in
 “ *France*, consulted the Doctors of physic upon these
 “ sicknesses; which, in my opinion, they found very new
 “ and altogether unknown to them; for I do not find
 “ that when we went away, our apothecary was charg-
 “ ed with any order or directions for the cure thereof.

The author afterwards observes it to be the scurvy,
 malady to which the northern nations, the *Dutch*, &c.
 are very subject; and upon this occasion, quoting a pas-
 sage from *Olaus Magnus*, says, “ I have delighted my-
 “ self to recite the words of this author, because he
 “ speaketh thereof as being skilled, and has well de-
 “ scribed the disease; only he maketh no mention of
 “ the stiffening of the hams, nor of the superfluous flesh
 “ which groweth in the mouth.” He further observe

(g) The *Indian* nation at *Stadacona* by this time had been cut off.

that the savages use frequent sweatings for cure of this malady; and that a singular preservative against it is content, or mirth, and a chearful humour; as it commonly attacked the discontented, idle, and repining. But the last and most soveraign remedy, was the *ameda* mentioned by *Cartier*, which he calls the *tree of life*. This *Monsieur Champlain*, who was then up the country, had orders to search for among the *Indians*, and to make provision of it for the preservation of their colony.

THE name of the disease is said to be in the history of *Saxony*, written by *Albert Krantz*; and if so, I believe he will be found the first author now extant who calls it the scurvy (*b*). It is next taken notice of by *Euricius Cordus*, in his *Botanologicon*, published *ann.* 1534. It is observed by one of the speakers in that dialogue, that the herb *chelidonium minus* is called by the *Saxons* *chorbock rout*, being an excellent remedy for that disease. Being asked, what disease this is? it is replied, It would seem to be the *stomacace* of *Pliny*; as it occasions the teeth to drop out, and all the mouth is affected by it. In the year 1539, it is mentioned in the same manner by *Jo. Agricola*, in his *Medicina herbaria*. *Olaus Magnus*, in his history of the northern nations, published *ann.* 1555, observing what diseases are peculiar to them, gives us a long description of the scurvy (*i*).

Soon

(*b*) He brings down his history to the year 1501. According to *Melchior Adams*, and *Chevreau* in his history of the world, he died *ann.* 1517. I own I could not find it in the edition which I perused: but it is said so by *Wierus*, *Schenkius* in his observations, and others; unless they have mistaken him (which could not be *Wierus's* case) or *Geo. Fabritius*, an author who flourished about the year 1570, and mentions, in his *Annales urbis Misnæ*, a disease breaking out in the year 1486, *viz.* the scurvy; which he very imperfectly describes.

(*i*) *Est et alius morbus castrensis, qui vexat obsessos et inclusos, talis, viz. ut membra carnosæ, stupiditate quadam densata, et subcutaneo tabo, quasi cera liquefens, digitorum impressioni cedant; dentesque, veluti carnosos, stupefacit; colores cutium candidos reddit cæruleos, torporemque inducit.*

Soon after we find three eminent physicians, all contemporary, treating expressly of this distemper, viz *Ronssseus*, *Echthius*, and *Wierus*. To whom *Langius* may be added as a fourth, having wrote two epistles upon this subject. What is called *Echthius's Epitome*, was the first wrote, though the last published. It would appear from *Forrestus* (k) to be a letter sent, in the year 1541 to *Blienburchius*, a physician at *Utrecht*; whose answer is now lost. The first book published expressly upon the scurvy was by *Ronssseus*, in the form of an epistle. The year is uncertain, as he afterwards corrected, and reprinted it in a different form. He is so modest as to say, that had he first seen *Wierus's* accurate observations, he would not have published any thing upon the subject. There is an edition of *Ronssseus* put down by *Mercklin* (l) and *Lipenius* (m), in the year 1564; and of *Wierus's* observations in 1567. The learned Dr *Astruc* (n) is of opinion, that these last were not published till 1580. It is thus far certain, that those authors corresponded together; and upon *Wierus* sending to *Ronssseus* *Echthius's* letter, now called his *Epitome*, he published

inducit, cum medicinarum capiendarum nausea; vocaturque vulgæ gentis lingua scorbock; Græcè, cachexia, forsitan à subcutanea morbiti putrescente: quæ videtur esu salforum ciborum, nec digestorum nasci, et frigidâ murorum exhalatione fieri. Sed vim tantam non habet, ubi muri interiùs tabulis quorumcunque lignorum sunt cooperti. Insuper, si diutiùs grassetur iste morbus, absinthiacò potu continuato illi arcere solent. Lib. 16. cap. 51. Viribus, primis annis, demum (multa lite stragibus continuis diminuto) artibus, dolis, et insidiis, obsidentium furripiunt commeatum, præsertim pecudes; quas secum abductas, in herbosâ domorum tectis pascendas imponunt; ne, defectu carniùm recentiorum morbum incurrant, quibusvis ægritudinibus tristiorum, patriâ lingue scorbock nuncupatum; hoc est, saucium stomachum, diris cruciatibus diuturno dolore tabefactum. Frigidi enim et indigesti cibi avidiùs sumptum morbum hujusmodi causare videntur, qualem medici cachexiam universalem appellant. Lib. 9. cap. 38.

(k) *Observ. medic. lib. 20. obs. 11.*

(l) *Linden. renovat.*

(m) *Bibliotheca real. medic.*

(n) *Lib. de morbis venereis.*

it, together with his own work, *Wierus's* observations, and two of *Langius's* epistles, in the year 1583.

C H A P. II.

Bibliotheca scorbutica: or, *A chronological view of what has hitherto been published on the scurvy.*

JOan. Echthii de scorbuto, vel scorbutica passione, epitome. A. D. 1541.

He proposes it as a question, Whether the blood here may not be corrupted, without the spleen or any other of the *viscera* being affected? but is inclined to think the spleen often is. He assigns as causes of this disease, gross unwholsome food, of salt, dried, or putrid flesh and fish, pork, spoiled bread, stinking water, &c. He distinguishes the symptoms into two classes. The first contains such as appear at the beginning, and are common to it with other diseases; the second, the succeeding and more certain signs of the malady. Under the first, he comprehends a heaviness of the body, with a spontaneous lassitude, generally most sensibly felt after exercise; a tightness of the breast, and a weakness of the legs; an itching, redness, and pain of the gums; a change of colour in the face to a darkish hue: and observes, that where all these concur, we may foretel an approaching scurvy.

But the more immediate and certain signs he enumerates under the second class, *viz.* a foetid breath, a spongy swelling of the gums, which are apt to bleed, with a loosening of the teeth; an eruption of leaden-coloured, purple, or livid spots, on the legs; or of somewhat broader speckled or dark-coloured *maculae*, sometimes on the face, at other times on the legs. As the disease advances, the patients lose the use of their legs, and are

subject to a difficulty of breathing, particularly when moved, or when they sit erect; at which times they are apt to faint: but upon being laid down again, they recover, and breathe freely; nay, when lying, they affirm that nothing ails them. But as they cannot always thus continue without some motion, they are subject to these perpetual swoons. The appetite is seldom bad; on the contrary, they generally have a good one. There is sometimes observed an aggravation of the symptoms; with some on the fourth or fifth day, in others on the third. Some few have it every day, but without any fever: others become feverish. Preceding fevers may terminate critically, as it were, in the scurvy, and with such scurvies whole families and monasteries are together infected; which generally end either in a deadly dysentery, or, at other times, in a sudden and mortal faint. During the course of this disease, some are apt to be very costive; while others have a continual *diarrhæa*. Sometimes their spotted legs swell so monstrously, as to resemble the *elephantiasis* of the *Arabians*; while others have them so extenuated, that the bones seem only covered with skin. The spots of some separate into black and dusky scales, like the *morbæa* and leprosy of the *Greeks*; while in others they remain soft, smooth, and shining; and the impression of the finger continues for some time upon the part. In those who die, the spots sometimes disappear; at other times they break out afresh. Lastly, There have been observed varicose swellings of the veins, as in those under the tongue, and of the lower lip.

He afterwards delivers the indications of cure, without giving us any remedies. And it may not be amiss to remark, that this is the first description now extant of the scurvy by a physician.

epist. 13. de novis morbis; epist. 14. de veterum stomachica et sceletyrbe, et morbi Gallici tuberibus.

These two epistles were reprinted by *Ronssseus*, as serving to prove the scurvy to have been a disease known to the ancients.

Balduini Ronsssei de magnis Hippocratis lienibus, Plinique stomachace ac sceletyrbe, seu vulgò dicto scorbuto, commentarius. Ejusdem epistolæ quinque ejusdem arguenti. 1564.

He ascribes the frequency of the scurvy in *Holland* to their diet and air; to their eating great quantities of water-fowl; but principally to their living on flesh, first salted, then smoked and dried. The weather, he says, had a very great influence upon this distemper. For though it was met with in the country at all seasons; yet, by long observation and experience, he had found, that a moist air, and southerly winds, contributed greatly to increase it: and instances in the year 1556, when, during that whole year, they had almost continual rains, with southerly and westerly winds; which were followed by a great frequency of this disease; and to such a height, that many were brought in danger of their lives by it. In 1562, after a very rainy season, there likewise ensued frequent and very troublesome scurvies. So that although this malady was at all times endemic with them, from the peculiar air of the country, and their bad waters; yet, upon very slight occasions, it often became more general or epidemical during a moist season. It usually prevailed most in spring and autumn; was milder in the spring, and shorter: but in the autumn, it was of longer continuance, and more obstinate; so as sometimes to endanger the life of the patient. No age was exempted from its attack; which, though severest with old people, yet was more incident to those of a middle age.

From a mistaken theory in judging it a disease of the spleen,

spleen, he begins the cure by bleeding. He afterward prescribes an aperient and attenuating decoction of a number of antiscorbutics, with the addition of *senna*, and some other purgative ingredients: but observing, that the more simple compositions were generally the most efficacious, he thinks, that the use of scurvygrass, wormwood, and germander, is alone sufficient; the vulgar curing themselves by scurvygrass, brooklime, and water-cresses. At the end of the cure, he gives gentle physic; forbidding all violent and acrid medicines, especially drastic purgatives; till towards the decline of the malady, when the patient is able to bear them. For twelve years past he had used with great success, both for prevention and cure, a tincture, in spirit of wine, of *fumaria*, *cochlearia*, *absinthium*, and *chamædrys*, or herbs of the like virtue. The spirit was extremely well saturated by repeated infusions of the fresh plants, and the belly kept moderately open during the course.

As to diet, upon which much depends; he orders it should be inciding and attenuating. They must abstain from all kind of sea and water fowls; from pork, and salt meats. Their drink should be a wormwood and germander wine by turns. He prescribes a gargarism with alum and honey for the mouth; and orders the rigid tendons in the ham, after friction, to be anointed with cowfeet jelly. He has several remedies for the ulcers on the legs. To prevent the disease, he recommends gentle physic in the autumn; but especially the use of a light wormwood ale or wine: by which (with the help of a diet of easy digestion, the benefit of good air, and dry lodgings) he has known it often not only prevented, but cured.

In his first epistle, he accounts for the frequency of this distemper in some places more than in others; from their different soils, climates, and weather, and especially from the quality of the waters they used: and observes, that universally, in marshy and boggy countries, people were most

most afflicted with the scurvy; though their diet and other circumstances were alike with others. In his second epistle, he maintains, that this distemper was known to the ancients, against the opinion of *Wierus*; and remarks, that seamen in long voyages cure themselves of it by the use of oranges. In his third epistle, he recommends the steel and mineral waters.

Jo. Wieri medicarum observationum hætenus incognitarum lib. 1. de scorbuto. 1567.

He transcribes all the symptoms out of *Echtbius* at great length, with the following additions. The weakness in the legs felt upon the approach of the disease, is attended with a stiffness there, and a small pain. The flesh of the gums is often destroyed to the roots of the teeth. Smaller spots, resembling blood sprinkled upon the part, (or flea-bites, but larger), appear on the legs, thighs, and on the whole body; but the very large, livid, and purple spots, chiefly on the legs. Sometimes this livid colour will shew itself in the *fauces* of those who are near death. In the progress of the disease, the tendons of the legs become stiff and contracted. Some are seized with a slow erratic fever. After ardent malignant fevers, and double tertians, ill cured, he has known the scurvy to follow; upon which a malignant quartan has ensued. This still left the scurvy behind it; which was at last cured by the proper method. When the legs are greatly swelled, they are sometimes altogether of a livid colour. The pulse, as in a quartan fever, varies: so that at different times, and according to the state of the disease, it is small, hard, quick, and weak. The urine is reddish, turbid, thick, and fæculent, like new red wine, resembling that which is usual in the fit of a quartan when sweating; and of a bad smell. He adds afterwards, in his prognostics, that if ulcers break out on the *tibia*, they are with great difficulty healed up; being extremely fœtid, of a gangrenous

nous disposition, and so putrid, as not to feel the application of a hot iron.

He assigns as causes of this distemper, unwholesome air, such bad and corrupt food as was used in the northern countries, and by their shipping, *viz.* stinking pork, smoked rancid bacon, mouldy bread, thick *fæculæ*, ale, bad water, melancholy and grief of mind, preceding fevers, the stoppage of usual evacuations, &c.

Though he sometimes bleeds in the cure, yet he forbids it when the disease is advanced. In this case after evacuating the *primæ viæ* by a lenient of *senna*, or the like, (observing that it does not bear violent purgatives), the patient is to be sweated twice a-day, *viz.* in the morning, and at four after noon, with a draught of four ounces of the expressed juices of the antiscorbutic herbs; which are, *cochlearia*, *nasturtium aq. e.* *nasturtium kyber.* of each equal parts, with but half the quantity of *becabunga*; adding a little cinnamon and sugar. The proportion of the different ingredients may be diminished or increased, according to the constitution of the patient, state of the disease, and heat of the body. He would have the herbs always fresh and green when used; and they may sometimes be boiled in goat or cows milk, or rather in whey: but their expressed juice mixed with whey, is preferable to their decoction. He sometimes adds *absinth. vulgare*, *fumaria*, *chamaedrys*, and, in certain cases, *nummularia*. To people who are fond of a *farrago* of medicines, he gives a long list of all the antiscorbutic and aperient herbs, roots, seeds, &c. to which later authors have made but a small addition; and remarks, that he generally made successful cures by a proper use of a few of these plants. The following remedy he understood had cured many. *R absinth. vulg. sicc. bacc. juniper. contus. ana manip. i. lact. caprin. lib. iv. Coq. ad tertiæ partis consumptionem.* A dram of saffron is to be infused in the strained decoction and a warm draught taken three times a-day. After gi-

ving

ving some other cures usual in his time for this distemper, he observes, that there is nothing specific in the common antiscorbutic herbs, as they are called; but that all acrid plants which incide and attenuate, as also many aperient roots, and warm seeds, are highly serviceable. At the same time, a diet of easy digestion, and similar intention, must be used, with good sound ale or wine with wormwood infused, or milk and whey. Care must be taken to procure dry chearful lodgings, and to banish grief, cares, &c.

He afterwards subjoins various topical applications for the different symptoms. For the putrid gums, *R sal. mar. alum. ana dr. ii. aq. font. lib. i. M. Bulliant simul.* The people of *Friesland* use the following. *R acet. cerevis. lib. ii. bol. armen. unc. fs. alumin. dr. ii. mellis unc. iii. M. Bulliant simul.* The *Saxons* add to the former, *herba sabina*. If the putrefaction is very great, *ung. Ægyptiac.* or *alum. ust.* mixed with honey, may be used; or it is to be stopped by touching with *ol. vitriol.* In his appendix, he particularly recommends whey for the cure of this disease; and gives a description, at great length, of the *cochlearia*, and some other antiscorbutic herbs.

Remberti Dodonæi praxeos medic. lib. 2. cap. 62. E. 1581.
usdem medicinalium observationum exempl. rar. cap. 33.
de scorbuto.

He ascribes the scurvy chiefly to bad diet. He relates, that it was occasioned in *Brabant*, ann. 1556, by the use of some corrupted rye brought from *Prussia* during a scarcity of corn. At this time many had not the spots; but their gums were chiefly affected. He gives an instance, however, of its being contracted in prison, where confinement alone was the occasion; the place being well aired, and the diet such as he thought could give no suspicion of its proceeding from thence. He never bled any patient in this disease, but the per-

son in the prison, who had signs of a *plethora*. He generally performed a cure by the use of a few herbs, *viz nasturt. hortens. et aquatic. cochlearia*, and *becabunga*; which last he esteems of inferior virtues to the others. These he thinks sufficient to remove the scurvy, if, at the same time, proper diet is used, especially well-baked wheat-bread. He sometimes gives a gentle purgative at first, and repeats it occasionally: but if the disease is far gone, caution here must be had. When only the gums were affected, he has cured these often by topical applications. The large livid scorbutic spots like bruises, are oftener seen on the lower extremities than on the arms. If the disease is very virulent, and not removed the *hypochondria* will also become livid; and the patient in this case be seized with violent gripes, and die.

1589. *De scorbuto propositiones de quibus disputatum est publicè Rostochii, sub Henrico Brucæo.*

The scurvy is endemic in particular countries, from their situation, air, water, and food. In these countries scorbutic mothers bear scorbutic children, often miscarry, at other times bring forth dead foetuses. He mentions no other symptom, but what is taken notice of by *Wierus*; except a pain sometimes in the right, at other times in the left *hypochondrium*, attended with a sense of weight. Upon the malady's increasing, the belly swells, and grows also painful; with an entire loss of appetite. In his theory of the disease, he supposes, that either the liver, or spleen, sometimes both, but oftener the spleen, was obstructed; although it was seldom found scirrhus. He afterwards says, there is often no swelling or obstruction in any of these parts; though, from the quality of the scorbutic humour, produced by improper and gross food, it was natural to expect the spleen might be affected. When the disease is very inveterate, it degenerates into the *affectio hypochondriaca*; a distemper frequent among the inhabitants on the shores of the *Baltic*.

It is sometimes complicated with other diseases, *viz.* the dropsy, atrophy, and bilious diarrhœa; at other times there is a slow continual fever, and sometimes a tertian intermittent.

His cure consists in diet and medicines. For the first he directs well-baked wheat-bread; broth of flesh or fowls, with radish, hyssop, thyme, savory, or the like herbs. He allows all sorts of flesh or fowl (except water-fowls) that are of easy digestion, and afford good nourishment. Whatever is dried, salted, smoked, long kept, and rancid, or of gross and difficult digestion, is to be avoided. Milk is proper for those who are far gone in scorbutic atrophies. At table the antiscorbutic herbs are to be used by way of salad; and for drink, ripe *Rhenish* wine, or good sound beer, with wormwood infused. After a gentle bleeding, if indicated by a *plethora*, and clearing the first passages with a lenient purgative; *cochlearia*, *nasturtium*, *becabunga*, and *rad. raphani*, are to be given boiled in milk; or their expressed juices, mixed with whey; adding *absinthium* or *mentha*, if the stomach is weak; *acetosa* and *fumaria*, where the constitution is hot, and a fever apprehended; or *rad. belenii*, and *herb. hyssopi*, when the breathing is affected. If the patient is of a cold habit, has œdematous legs, and the spots are black, the juices are best given in wine, with cinnamon or ginger: or he may take an infusion of *rad. raphani* in *Rhenish*. The author likewise recommends the sweating course from *Wierus*, particularly the laticonic or dry bath, when the scurvy appears on the external habit or skin. The belly is to be kept open by gentle physic, given in goat-whey, repeated every day, or every other day, during cure, as the patient bears it. This method, together with the diet before recommended, will effectually remove the scurvy. For lax and bleeding gums he orders the pickle of olives; but in his other receipts transcribes from *Wierus*.

De scorbuto tractatus duo ; auctore Balthazaro Brunero.

He has copied *Wierus* in most things ; but is more explicit and full in describing the air productive of the malady. Thus, if the atmosphere of any place is impure, and polluted with exhalations that are gross, moist, putrid, or liable to putrefaction, it begets this infection ; as in marshy, damp, and maritime countries ; or places where stagnating waters are left after inundations. To which also rainy seasons contribute a great deal, especially where the sun has not influence sufficient to raise and dissipate the vapours of such waters stagnating in the country and marshes. To the diet observed by other writers to occasion the scurvy, he adds black coarse bread ; and observes, that the pernicious effects of such diet and air are considerably augmented, by immoderate watchings, the sorrowful passions of the mind, and stoppage of the natural and usual evacuations. People, by way of prevention from this disease, when in the air of *Saxony*, take plenty of mustard-seed, finding the good effects of it by experience, together with gentle astringents.

He describes the symptoms and cure in the same manner as *Wierus* ; only, by a typographical error, the *deliquium animi* is said to occur when the patient sweats ; having *sudat* instead of *sedet*, (when he sits up). The whole is taken from *Wierus* ; who immediately adds, *decumbens respirat facilius, reficiturque*. It may be proper to note another mistake which he and many other authors have fallen into, in transcribing a medicine from *Wierus* for phagedenic ulcers of the gums. It is the following. *R. mercur. sublimat. scr. ii. alum. ust. dr. ii. fs. aq. plantagin. lib. i. M.* But as this author, in his observations, wrote in *Dutch*, had called the first medicine simply *sublimate*, after the manner of the chemists, by which he meant mercury ; his translator into *Latin* unluckily here put in arsenic, making it to be *arsenici sublimat.*

Limat. scr. ii.; in which dangerous mistake many have followed him.

Brunerus has but one singular observation, *viz.* He has often remarked, that violent pains in the legs preceded the scurvy, and that the spots and putrefaction of the gums followed upon them. These are chiefly about the ancles and joints; on the *tibia*, and soles of the feet; sometimes in other parts of the body; attended with a sense of heat and pricking betwixt the skin and flesh. If they continue long, and especially if they become most severe in the night, and do not yield to medicines, and are exasperated by oily and greasy applications, it is a certain sign of a future scurvy. The pains cease upon an eruption of the spots, which are here generally very large. In this case, warm steams, discutient fomentations and cataplasms, must only be used, and, if possible, a sweat procured upon the parts. He concludes with the case of a scorbutic patient; whom he first purged, then ordered the juice of water-creesses in goat-whey; of which six ounces were taken twice a-day; and, by sweating him, a number of scorbutic spots appeared, by which a violent pain in the thigh was allayed.

Scorbuti historia proposita in publicum; à Solomone Alberto, &c. 1593.

He is of opinion, that the disease may be hereditary, or got from an infected nurse, and that it is contagious; but adds nothing to the description or symptoms of it as delivered by *Wierus*, unless it be a stiffness or *rigor* of the lower jaw, seemingly from a contraction of the temporal muscle; in the same manner as the tendons in the ham become stiff and contracted in the progress of this malady, as had been observed by all authors. He says, it is most usual in children, and in either a hereditary scurvy, or that which is got from the nurse.

He treats of the diet proper in this disease at great length:

length: recommends the juices of acid and auster fruits, *viz.* oranges, and the like; with which roasts meats when on the spit are to be sprinkled. These are likewise to be put in soops, and vinegar and wine in the gruels and barley-water. Exercise is necessary.

In his pharmaceutical directions, he orders bleeding at first, but only if there be a *plethora*; observing, that when the disease is advanced, especially if the spots have appeared, it is extremely improper. In this case if there is an obstruction of the *menses* or *hæmorrhoid.* these evacuations are by all means to be promoted; which will be of great service, though they may not prove a cure; having seen women regular after childbed, yet over-run with the scurvy. He prescribes very gentle physic, observing the mischief done by violent purgatives; then gives a numerous catalogue of aperient and deobstruent medicines. Whatever incides, deterges, and attenuates gross, viscid, and fæculent humours, is proper, in order to their being prepared and fitted for evacuation by any of the outlets of the body. For this purpose, in a particular manner, the common antiscorbutics, *viz.* *cochlearia*, *nasturtium*, and *becabunga*, are adapted; being such whose virtues have been approved by long experience. To these he afterwards adds other herbs under the denomination of *hepatic*, *splenetic*, and *thoracic*; from an imagined property in them to remove obstructions, and relieve and strengthen particular parts and bowels. When by these means all obstructions are removed, and the morbid humour, the immediate cause of the disease, is sufficiently attenuated and prepared, he observes nature itself will throw it out of the body, either by the kidneys or skin. It is the business only of art, to farther her intention, by giving diuretics if it tends to the kidneys; having particularly remarked, that, by a flow of urine, the disorders of the breast in this disease were most effectually relieved: or by taking diaphoretics and sudorifics internally, at the same time sweat-

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ing in stoves and in baths moist and dry; as it is often dissipated by insensible perspiration, at other times by profuse sweats. The dregs of the disease evacuated this way, have been observed to foul the very skin. He remarked, that scurvies were very frequent in that and the preceeding year, from the unconstant weather and very rainy seasons they had after warm summers.

Petri Foresti observationum et curationum medicinalium lib. 20. obs. 11. de scorbuto malo cognoscendo et curando; obs. 12. ibid. de quinque ægris à scorbuto curatis. 1595.

This is a long letter which the author wrote first to his brother in the year 1558, and afterwards sent to his two nephews students of physic, *ann. 1590.* He seems to have been acquainted with no other authors upon this subject but *Ronsseus* and *Echthius*. The last he copies in describing the symptoms; all which he confirms and illustrates by various cases of patients. He makes it a disease unknown to the ancients, though, according to his theory, a disorder of the spleen. It was indeed so little known in his time, that many died of it, (particularly one *Martin Dorpius* a clergyman at *Louvain*), to the great surprize of the physicians, who were entirely unacquainted with the very name of the disease, its nature, or method of cure. He mentions likewise one *Casbotus*, a counsellor at the *Hague*, who laboured under a virulent scurvy; and was given over by his physicians, when an *Amsterdam* physician discovered his case, and cured him; observing, that the *Hague* doctors did not know this distemper so well as those who resided at *Amsterdam*, or as he did at *Alcmaer*, where they became well acquainted with it by seeing it among the seamen. This last patient being subject to a relapse at times, our author prescribed him the juices of brooklime and scurvygrass boiled into a syrup with sugar; which effectually prevented the distemper. And this medicine, going under the name of *syr. sceletyrb. Foresti*, became afterwards

wards universally famous, and continued in repute for a considerable time, over all *Flanders*, *Brabant*, and *Holland*, for the cure of the scurvy. It was principally used in the winter-season, when the green plants could not be procured. He indeed very ingenuously owns that physicians were first made acquainted with those remedies by the vulgar; they having only contrived the exhibition of them in more elegant forms.

He illustrates the several intentions of cure at great length in the case of a sailor at *Alcmaer*, who fell into the scurvy after an autumnal-quartan, which had continued with him seven months. This person told him he had formerly the same disease at sea, in a voyage to *Spain*; and that it was very common among the *Dutch* sailors, who generally recovered by change of air, and the use of a wormwood-ale. But he had been quite cured of it before having had the ague. Upon this occasion, the author observes, he has known many fall into the scurvy after such intermitting fevers. The patient was troubled with a great difficulty of breathing, had lost the use of his limbs; his left knee and whole leg, being swelled, scirrhus, spotted, and so stiff, that he could not walk, or even move himself; his gums were swelled and bled. The physicians and surgeons said, he was poxed; but when the author saw him, he found it to be the scurvy. It was indeed a complicated case; the fever having left behind it a hectic disposition, with obstructed bowels.

Forestus, who has had great practice in this disease, says, the pathognomonic signs of it are, a straitness of the *præcordia*; weakness and pain of the legs; redness, pain, and itching in the gums; with an alteration of colour in the face. However, in the beginning it is not so easily known; being sometimes slow in its progress, and having the above symptoms, together with a lassitude after exercise, common to it with other diseases. But where all such signs appear together, he thinks it the beginning

beginning of the distemper, or at least there is some certainty of an approaching scurvy: though he sometimes hesitates here for some little time; till, in the progress of the distemper, the violence of those symptoms is increased; and the foetid breath, spongy bleeding gums, loose teeth, and purple and livid spots upon the legs, &c. confirm his former judgment of the disease. He proceeds to recite the symptoms from *Echthius's* epitome; adding, almost after each, instances of patients in whom they occurred. In particular, after the remarkable proneness to swoon in the height of the malady, he adds, that he has known several drop down dead instantly; as happened to a magistrate he mentions, who had a *Haerlem* physician to attend him, who said he was boxed; the ignorant in those days pronouncing all extraordinary and unknown diseases to be the *lues venerea*. However, this gentleman's son, labouring under the same distemper, was cured by our author. He recommends butter-milk when the patient is inclinable to be lectic: but where there was no fever, he cured many by milk alone, in which *coclearia* and *becabunga* were boiled. These observations, although extremely tedious, are valuable for the many truly scorbutic cases they contain.

*Hieronimi Reusneri diexodicarum exercitationum liber 1600.
de scorbuto.*

This voluminous author, remarkable only for his theory, describes the scurvy, in its different stages, altogether in the same manner as the authors before him; with the addition of the following symptoms. A hæmorrhage from the nose, which he says is usual even in the beginning of the disease; as likewise a continual spitting. Some have a pain at the mouth of the stomach, and there is a want of appetite; or at least if they long for food, it is rather hurtful to them. He observes, that scorbutical women are subject to the *fluor albus*, and

menses discolores. The urine is for the most part thin, pale, and watery, without any sediment, and of a foetid smell. The pulse is low, weak, slow, and inordinate. He is extremely prolix on the cure. But it were to be wished, that the many chemical and galenical remedies recommended, had been proved serviceable by experience, rather than by being agreeable to his theory.

1604. *De morbo scorbuto liber; cum observationibus quibusdam, brevique et succineta cujusque curationis indicatione. Auctore Severino Eugaleno.*

This book must have been published by the author in a very loose immethodical dress; as it has undergone several corrections by different editors; and the order of the whole is still very inaccurate. *Geo. Stubendorphius* published it in the year 1615, with great alterations; and *Brendel*, Professor of Medicine at *Jena*, ann. 1622, again corrected it; and with great labour has classed the different symptoms, or rather species of this disease, into different sections, making in all forty-nine in number. They will admit of several subdivisions; and comprehend a pretty round catalogue of almost all distempers, acute or chronic, incident to the human body. There are here also fifty prognostics, with thirty general diagnostics of the scurvy; besides the special diagnostics of each symptom, or rather disease, by which it is known to be scorbutic. But as I have elsewhere animadverted at great length upon this book, it may be sufficient here only to repeat, that the merit of the author has always been supposed to consist in his great sagacity in detecting this deceitful disease lurking under so many different forms. This he tells us was his professed design in writing. So that the description of the symptoms make up the greatest part of his performance. In the beginning of it, he assigns the same occasional causes of the scurvy as *Wierus* had done much more accurately before him; and to this author likewise he recommends us for the

the cure. The first five pages (as far as § 4.) contain what he has copied from other authors: but the rest of the treatise may, with great propriety, be deemed entirely new, and his own.

The symptoms are as follow. I. Putrid gums. II. Blackish, purple, and livid spots. III. Malignant ulcers. Acquainting us, that these are obvious signs, known even to the vulgar, he observes, that the disease often proves fatal before they appear; and therefore he proceeds, without stopping longer here, to other symptoms equally characteristical and demonstrative of the scurvy. But before we go any farther, it will be necessary to transcribe that peculiar state of urine and pulse which he so often refers to in his account of the following symptoms, and which was with him the pathognomonic signs of the disease.

The urine of those who labour under this malady, varies extremely, according to the habit of the body, the different nature of the disease, and of the putrescent humour. If there be only a slight putrefaction, and the disease but beginning, the urine is sometimes of a citron colour, and thin; at other times thick and white. But such urines discover nothing certain concerning the scurvy. As the distemper increases, it becomes sometimes thin, and of an intense red colour, inclining to a livid hue. If the patient passes this urine when seemingly in perfect health, having little or no drought, it is a certain sign of the scurvy. Frequently the urine appears thick, red, and manifestly livid; it either remains thus thick, or drops a thick red heavy sediment like bran or sand, besides having for the most part a thick turbid matter suspended a-top: such likewise is a demonstrative sign of the disease, provided the patient languishes, without any thirst or fever. Of some the urine is thick, white, and turbid; and drops several roundish whitish particles like sand, without becoming any clearer. The urine of those who live irregularly,

is in some thick, black, and turbid; in others blackish with an obscure paleness; and these persons have a violent thirst while they pass such urine. After those long accounts, he adds in another place, that where there is no fever, nor putrefaction of the humours, thick, white and turbid urine, having a white roundish heavy sediment, like sand or brick-dust, is the most undoubted sign of the scurvy. The pulse peculiar to this malady is quick and small, but particularly unequal.

We now proceed to transcribe the other symptoms. And the IV. is a difficulty of breathing; known to be scorbutic, *1st*, By the part affected; which is under the diaphragm, at the orifice of the stomach. *2dly*, By the complaint. It is a great and uneasy straitness and oppression upon the *præcordia*, not easily expressed. *3dly* By its remission and intermission; though sometime it is almost continual. *4thly*, By its having none of the symptoms which usually follow disorders of the breast, *viz.* cough, pain, *orthopnoea*, &c.

V. Vomitings, retchings; and even the *cholera morbus*. A vomiting is known to be scorbutic, *1st*, By not yielding to the common medicines, and those prescribed by the ancients in this disorder; on the contrary, the patient becomes worse after using them. *2dly*, Its sudden unaccountable remission, and equally unexpected return. *3dly*, Its seizing without any previous pain, disorder of the stomach, or a distemper described by the ancients. The retchings are here very violent, without bringing up much from the stomach. But the most certain proofs are had from the urine and pulse. VI. A looseness, or costiveness of the belly. VII. A bastard dysentery; known to be scorbutic by want of gripes, the blood not being mixed with the excrement; but chiefly by the pulse and urine.

VIII. Irregular fevers. IX. Intermitting fevers. X. Continual fevers. Under these he comprehends most species of fevers, *viz.* slow, putrid, remitting, and intermitting

permitting, of all kinds. They are all ascertained to be scorbutic, by the anxiety upon the *præcordia*, not agreeing in type with those of the ancients, &c. but more infallibly by the pulse and urine. The first, though strong and hard during the fever, upon its remission returns again to its peculiar, small, and unequal state.

XI. Fainting-fits. XII. Pains of the legs. XIII. A pain in the hands, and ends of the fingers. This is known to proceed from the scurvy by the pulse. XIV. A pain in the neck. XV. Pains in almost every part of the body, *viz.* the teeth, jaws, back, &c.; burning pains in the kidneys, head, arms, &c. XVI. The bastard pleurisy; discovered in a girl to be scorbutic, by the smallness and inequality of the pulse; the intermission of the pain; and being free from cough but at times; by the urine, and her having no thirst, and breathing without pain. But the intermission of the pain, and its returning at intervals, are sufficient to distinguish this from the true pleurisy. XVII. Violent colic pains; easily known when scorbutic, by their intermission, the urine, and pulse. He gives two instances of ruptures occasioned by the acuteness of these pains. XVIII. Hard tumours similar to those in the pox, *viz.* in the groin, and other glandular parts of the body; or in any other part, as in the interstices of the muscles, &c. They are often varicose. These give no pain while the patient is at rest, and the part kept easy; but upon walking, or hanging the legs, they become so very painful as to occasion fainting. Sometimes the whole body is covered with such tubercles. XIX. Weakness of the legs upon walking. XX. Retraction of the heel backwards towards the ham; known when occasioned by the scurvy, from the pulse alone. XXI. Troublesome prickings in the soles of the feet, next day followed with a palsy of the lower extremities. XXII. A palsy of the legs; distinguished from palsies described in ancient authors, by differences very equivocal, and too long here to mention. XXIII.

A *hemiplegia*. XXIV. Weakness of the whole nervous system. XXV. A colic ending in a palsy. XXVI. A convulsion or contraction of the members, gradually approaching. XXVII. The epilepsy is known when scorbutic, by the pulse and urine; as likewise, *1st*, By its attack accompanied with a fever. *2^{dly}*, Its sudden attack, and equally sudden remission. *3^{dly}*, Its proceeding from no cause assigned by the ancients. XXVIII. An apoplexy. XXIX. Convulsion of a particular part. XXX. The gout; known to proceed from the scurvy, by not being fixed, but shifting from one joint to another; and its being quickly cured by antiscorbutics. XXXI. The dropsy; requiring quite a different method of cure from that described by the ancients; and is easily distinguished from it, by the *dyspnœa* becoming much worse after purgatives. The difficulty of breathing is at all times greater, even in the beginning; with extreme anxiety under the diaphragm. XXXII. The encysted dropsy. Before this is fixed in any particular place, it causes a momentaneous swelling as it were, in different parts of the body; which most commonly happens upon change from a finer to a thicker air, or to those who use gross food; otherwise the legs swell first, then the whole body is covered with a hard and unequal swelling, and with various indolent tubercles, &c. XXXIII. The scorbutic atrophy; which can be cured only by antiscorbutics. It is known by the patient's languishing, without having any disease described by the ancients; by the pulse, urine, and recurring anxieties; but especially by spots on the body. XXXIV. Ulcers and gangrene of the toes. XXXV. Ulcers on different parts of the body, cancers, &c. XXXVI. Pestilential fevers, and their tumours; distinguished from the true plague, generally by the mildness of the symptoms, but more easily by the pulse, and sometimes by the urine. XXXVII. A mortification, either with or without ulceration. XXXVIII. The scorbutic *erysipelas*; known by the pulse, urine, and shifting

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ing its place. XXXIX. Madness, and the memory impaired. These two more rarely occur, being not so demonstrative symptoms of the scurvy as many of the preceding. XL. *Carus*, and a profound sleeping. XLI. A salivation. XLII. A *languor*, without any evident cause. XLIII. A disorder like to a *languor*. XLIV. Copious sweats, the forerunner of an atrophy. XLV. A cutting or tearing pain in the accession of fevers. XLVI. A tossing or concussion of the limbs, being a mixture of a paralytic and convulsive disorder. XLVII. *Tremor* of the limbs. It is known to be scorbutic by the pulse alone. XLVIII. Ulcer of the *penis*. XLIX. Dry ulcers. The book is concluded with seventy-two observations, containing a variety of cases in these diseases.

Feliciſ Plateri praxeos medicæ lib. 3. cap. 4. de defæ- 1608.
ratione. Under which title, he treats of the *lues venerea, scorbutica, and elephantica.*

He ſeems not to have ſeen *Eugalenus's* book, or at leaſt has copied nothing from it: for he ſtill delivers the ſame deſcription of the ſcurvy, as *Wierus*, and all other authors preceding *Eugalenus*, have done. He, however, takes notice of one ſymptom not mentioned by them, *viz.* tumours, ſometimes indolent, at other times more painful, reſembling a ſcrophulous gland. Theſe are ſeated either on the glandular parts of the body, or in the interſtices of the muſcles. The ſweat of ſcorbutic perſons is foetid; their urine red and turbid; their pulse feeble; as had been obſerved by all others before *Eugalenus*. He ſeems inclined to believe, that, like the *lues venerea*, the ſcurvy might have been brought from abroad, eſpecially by failors. It ſometimes produces convulſions and palsies; and may end in an atrophy, conſumption, dropſy, or dyſentery. He recommends for prevention, as alſo cure, a confection of muſtard-ſeed and honey; likewise the juice of oranges.

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This last is to be used for gargarising the putrid gums as also *sal. prunell.* dissolved in a proper liquor. The patient may be sweated with *decoct. lignorum.*

1609. *Gregor. Horstii tractatus de scorbuto.*

This author is in many places seemingly inconsistent with himself; having first followed *Forestus*, then *Eugalenus*, in his description of the disease; concluding with a diet, regimen, and cure, transcribed chiefly out of *Albertus*. The remote causes are, thick foul air, and gross viscid food; both which, as productive of the scurvy, he pretty well describes. He observes, that though in the *Lower Saxony*, and *Old Marche of Brandenburg*, it was a disease generally very well known; yet in some places it was a much rarer and slighter malady than in others; being most frequent and dangerous where they used thick unwholsome new ale, and where the soil was marshy and damp. So that the year before, when he practised in the *Old Marche*, he found it extremely frequent at *Soltquell*; but much less so in the neighbouring country. In that place, besides using the same gross food as other northern countries, their situation was very marshy; and they drank thick new ale hardly cold, without hops, which had undergone no fermentation or depuration. He recommends *sp. vitriol.* given along with antiscorbutics; and has perhaps nothing else new on the disease, but theory.

Matthæi Martini de scorbuto commentatio.

He copies entirely from *Eugalenus* his description of the scurvy, adding some new symptoms first mentioned by himself; such as, swelling of the eyes, recurring darkness over them; virulent ulcers upon the *uvula* and *fauces*; such variety of pains in all parts of the body as cannot be expressed, *viz.* tensive, pulling, pricking, biting, eroding, gnawing, &c. on the muscles, membranes, and nerves. These are not only severest in the night-

night-time, (as is most commonly the case), but afflict likewise in the evening, morning, and through the day. They may all with great certainty be known to proceed from the scurvy, by the smallness and inequality of the pulse. Even pains peculiar to each part, are rendered wonderfully anomalous by the scurvy. This disease is nearly allied to the plague; as it occasions carbuncles, buboes, cancers, &c. Most tertian vernal fevers are scorbutic. A sudden and unaccountable loosening and fastening of the teeth; large fissures in the lips, closing in a most surprising manner after drinking, are symptoms of the scurvy. Here *Eugalenus* is every where an oracle; his whole book being transcribed, and digested into a much more methodical order, with the addition of some things from *Wierus*, *Albertus*, &c.

Dan. Sennerti tractatus de scorbuto. Ejusdem practi- 1624.
e medicinae lib. 3. pars 5.

He has transcribed from *Eugalenus* and *Martini* all that they have said on the disease. This, together with his theory, makes up the greatest part of his book. What he calls his own new and rare observations, are as follow. One is the case of a student, who, upon the striking in of an itch, was seized with a *gutta serena*, difficulty of breathing, and tightness of the breast. He recovered his sight by the use of some purgative medicines, and diuretics of the antiscorbutic kind. The other, a boy of twelve years of age, who had also the itch; and it being repelled by an improper unction, he lost his sight, and afterwards died epileptic. The author having often remarked, after an itch in such manner injudiciously treated, pains and prickings in the breast to ensue, with bastard pleurisies; and likewise tertian and quartan fevers, which were removed upon the appearance of the eruption, but returned again upon its disappearing; from thence he concludes the scorbutic

humour combined with the *scabiés*, to have produced those surprizing symptoms.

He then proceeds to still more uncommon and remarkable symptoms of the scurvy; and, upon the testimony of *Doringius*, relates cases of a jaundice ending in a *hydrops ascites*; an asthma; a *tinea*, covering not only the whole scalp, but the forehead; a *herpes* of the left arm; a gangrene in the fore-finger; a hæmorrhage from the lips, no conspicuous orifice of a vein being discovered; palpitations of the heart; burning and intolerable pain in the soles of the feet, with livid spots on the legs; and a running of putrid and purulent matter from the *uterus*. *Timoth. Utricus* observed not only the knees, but the whole body, as it were, contracted; with an excrescence of flesh from the eyes under the *palpebræ*; the *tunica adnata* of the eye being yellow, but the *palpebræ* of the same colour with the *iris*. In some though more rarely, upon each motion of their joints, noise was plainly heard as from broken bones, or like the crackling of nuts. Where there was a dropsy, in night's time the whole teeth became loose, so that the patient was in danger of losing them all; but next day they were found firm in their sockets. In a patient where no spots could be made to appear, even by the help of medicines, upon forcing a sweat, the muscular part of the arm was seized with a sense of heat and burning, as if drops of boiling water had been thrown upon it; mean while nothing was to be seen appearing outwardly. A widow in a continual fever, had her whole body covered with large black spots; her face resembling in colour the skin of smoked bacon boiled. Upon which he concludes, such is the strange variety of diseases and symptoms occasioned by the scurvy, that not only the vulgar, but even a physician unacquainted with the distemper, would be greatly amazed, and might believe the person to have died of poison. He very ingeniously, however, accounts for them all, according

to his own *hypothesis*; making up sixty-two symptoms, by adding several to what are mentioned by *Eugalenus*, viz. blindness; a stench of the body; a stoppage of the courses in women; in place of which they have a white acrid saltish running, apt to infect men; and men from this disease are rendered unfit for generation, by having a watery vitiated *semen*. He is very prolix on the cure; copies from his predecessor *Albertus* the therapeutic intentions; and abounds with almost all the *recipe's* given by preceding authors, together with what he learned from other hands. Where there is a heat of the body, or fever, he uses the cooling antiscorbutics, viz. *cichoreum, endivia, acetosa, acetojella, succ. citri, aurantior. limon. sp. salis, vitriol. vel sulphur*. He recommends steel where there is not the convenience of mineral waters; but forbids the use of vinegar in this disease.

Arnoldi Weickardi thesaur. pharmaceutic. galeno-chemic. sive tractat. practic. &c. lib. 3. cap. 5. de stomachace, seu scorbuto. 1626.

This author, although usually ranked among the number of writers on the scurvy, has nothing new upon it. He makes no mention of the symptoms. His cure consists in bleeding, purging, and afterwards sweating the patient, and in administering the common antiscorbutics in very improper forms; all transcribed out of other authors.

Gul. Fabricii Hildani observ. et curationum chirurgic. cent. 5. obs. 5. 1627.

There is here a short letter to the author from *Ludov. Schmid*, giving an account of the Prince of *Baden's* youngest son, a child of fourteen months, afflicted with the scurvy; who was cured with antiscorbutics. *Hildanus*, in his answer, mentions an obstinate scorbutic ulcer cured likewise by antiscorbutics; which is all that is to

be met with on this disease in the works of that celebrated practitioner.

1633. *Joannis Hartmanni praxeos chymiatricæ p. 345. de scorbuto. Ed. Genev. Opus posthumum.*

He is the first who observes the pernicious effects of mercury in the scurvy; for the cure of which he relies much upon some chemical preparations, viz. *tartar. vitriolat. sp. vini tartarizat. &c.*

1640. *Lazari Riverii praxeos medicæ lib. 12. cap. 6. de scorbutica affectione.*

As the scurvy was hitherto so little known in the southern parts of *Europe*, that it had not been so much as mentioned by any author there, he likewise would have omitted treating of it; the disease never appearing in *France*, attended with all the symptoms described by northern writers. However, as diseases were observed accompanied with some of its symptoms, and as those authors inform us, that one symptom peculiar to the distemper was sufficient to discover it, he would therefore describe it. But as it was a malady by no means common in his country, where most physicians believed they had no such disease, he does not pretend to describe the true scurvy; therefore calls it the *affectio scorbutica*, as approaching near to it. He thinks the scurvy nothing else but the *affectio hypochondriaca*, attended with such extraordinary and unusual symptoms as denote a degree of malignity; and imagines the *pancreas* is often affected.

1645. *Consilium medicæ facultatis Hafniensis de scorbuto.*

This was published for the benefit of the poor in the country; and is divided into four sections. The 1st recites the cause of the disease, and the signs by which it is known; the 2d, how it may be prevented; the 3d, how

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how it ought to be cured; the 4th, what is proper for the removal of its primary symptoms.

Sett. 1. They observe, that it is an endemic evil with them and other northern nations. It attacks the patient in various shapes, according to his habit and constitution, or other diseases with which it may be complicated. The immediate cause, is a bad concoction, from a crude, melancholy, corrupted humour, oppressing the organs, both of the first digestion in the stomach, and of sanguification. Hence ensue for the most part difficulty of breathing; swelling, putrefaction, and bleeding of the gums; loose teeth; a weakness, swelling, and stiffness of the legs; spots, and the like. The external causes are, 1. The impure, gross, moist, and cold air, of their country; those persons being most subject to it who live in the northern parts near the sea, or where they are surrounded with lakes. 2. Gross and corrupted food, *viz.* bad bread, not sufficiently baked, made of spoiled flour; salt and dried flesh and fish; old cheese; rancid butter; pease, and other grains, when spoiled; together with unwholesome malt-liquors. 3. Those of a sedentary inactive way of life are most afflicted with it; together with those, 4. who are apt to be costive, or labour under a suppression of any natural evacuation; as also the dejected and sorrowful. 5. This disease often succeeds others; as obstructions of the liver and spleen, and particularly quartan agues. It is likewise hereditary and infectious. From these external causes proceeds the internal or immediate cause of the disease before mentioned. Although the malady may not easily be discovered in the beginning, by reason of its appearing under the form of other diseases; as also from its unexpected and slow attacks, (so that, in countries in which it is endemic, we are to suspect anomalous diseases not yielding to the usual remedies, especially if the patient is of a melancholy disposition, to be scorbutic); yet when the distemper is violent, it is easily known. It is usually preceded

ceded by a lassitude of the whole body, weakness of the legs, breathlessness upon walking, a livid colour of the face, and by a greater corpulency. In its progress, flying heats become troublesome; the gums itch, with a great flow of *saliva*; the urine is sometimes turbid, at other times quite watery. When farther advanced, the difficulty of breathing is so great, that the patient cannot walk or move himself, but he falls into a swoon; of which he recovers when laid in bed. It is attended with colic-pains; the gums are swelled, and bleed upon the least touch; the teeth are loose, and fall out without pain, the flesh at their roots being quite putrid; the breath is foetid; and the legs swell, and grow stiff, so that the patients cannot walk. Sometimes on the legs, and over the whole body, there appear various red, purple, or azure spots. Now and then they are afflicted with the *erysipelas*, malignant ulcers, and nocturnal pains; and sometimes the body wastes away. Different fevers, and various symptoms, almost of every kind that can be mentioned, often accompany this disease. The urine is turbid, thick, and clayish, of a purple colour; but it does not long retain the same appearance. The pulse is variable; sometimes weak, at other times strong, when the patient seems very weak; and now and then it is altogether obscure. This evil is easily removed by proper remedies in the beginning; but when advanced, it is not so easy to prevent relapses. Where proper diet and medicines are neglected, health is seldom restored. It commonly ends in a dropsey or atrophy. A difficulty of breathing, and black spots on the legs, are dangerous symptoms; as also continual pains and *borborygmi* about the navel. A hereditary scurvy is seldom cured. It is a more dangerous disease in old people than in young. Where the mouth is affected, remedies are speedily to be used; otherwise the malady spreads farther, and may infect the whole throat

throat. Fevers and ulcers accompanying this disease, cannot be cured without antiscorbutics.

Seet. 2. Prevention is proposed, by living in dry lodgings; fumigating apartments, with the steam of aromatic woods and gums; and by avoiding such food as has been observed productive of the disease. There is likewise recommended the use of a wine medicated with wormwood; and several other warm, bitter, aromatic ingredients. The belly is at all times to be kept open, and the other evacuations (especially when suppressed) are duly to be promoted. Exercise, baths, physic in the spring and autumn, are also necessary. They who are very subject to it, are to take now and then two or three spoonfuls of the following antiscorbutic water; which may be made more pleasant and stronger, by adding some of their scorbutic syrup, which is the same with *Forestus's*. *R rad. raphan. rust. lib. iii. scorzon. unc. ii. cort. rad. cappar. tamarisc. ana unc. fs. fol. cochlear. nasturt. aq. petrosel. becabung. recent. ana manip. iii. sem. cochlear. cardui bened. aquileg. fœnicul. ana dr. iii. crem. tartar. dr. ii. gran. paradif. cardamom. ana dr. i. Affunde vini Rhenan. lib. xii. aq. cochlear. fumar. ana lib. i. Stent in digestionē 24 horis, dein per cineres destillentur.* Or they may take the juice of scurvygrafs mixed with wine; or their *elect. scorbuticum*, which is the conserve of several antiscorbutic herbs, with the addition of a very small quantity of *spir. vitriol*.

Seet. 3. and 4. containing the indications of cure, and the treatment of the symptoms, have nothing new; the medicinal intentions being pretty much the same as directed by *Albertus*. The whole is concluded with a number of long prescriptions, adapted to the various intentions of prevention and cure delivered in the *consilium*. Here the prices of the several medicines are marked for the sake of the poor.

machenden scorboets: or, An account and information concerning that painful disease the scurvy. By *John Drawitzs*.

This book has undergone no less than four editions, being esteemed the best written upon the subject in the *German* language. The diseases treated of as proceeding from the scurvy, are as follow. 1. The gout. 2. A spasmodic affection. 3. The palsy. 4. Pains in other parts of the extremities, though not in the joints. 5. The headach. 6. The toothach. 7. The pleurisy. 8. The belly-ach; or the scorbutic colic, and iliac passion. 9. A pain about the *os sacrum*, back, and *perinaeum*, resembling a true fit of the stone. He had been certainly informed from the *East Indies*, that the sailors there were speedily and effectually cured of the scurvy, by eating oranges; which he finds great difficulty to reconcile to his theory of the disease. He had heard from *Dantzick*, that some masters of ships carried out with them an acid water, got in the preparation of *antimon. diaphoret.* which prevented the scurvy at sea.

1662.

Baldassaris Timæi opera medico-practica.

This author gives us many histories in his writings, of such cases as he deemed scorbutic; *viz.* Book 1. of practical cases and observations; case 3. a scorbutic headach; case 7. a scorbutic delirium; and case 15. the hypochondriac melancholy, beginning with the scurvy. In his 3d book, case 24. an *hydrops ascites*, joined with the scurvy; and case 32. the *affectio hypochondriaca*, with this disease also; case 35. a scurvy and atrophy, of which the patient died; case 36. the *arthrit. vaga scorbutica*. Book 6. case 15. *scabies pruriginosa scorbutica*. Book 8. case 15. a scorbutic tertian; and case 18. a scorbutic quartan.

In his epistles, book 3. epistle 10. 11. and 12. the *cachexia scorbutica*; epistle 20. and 28. the *affectio hypochondriaca scorbutica*; and book 5. epistle 9. the *arthrit.*

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tis vaga. His method of cure, which has nothing new in it, is to be found in the 34th case of his 3^d book; by which he says he generally succeeded, unless the scurvy was hereditary, or very deeply rooted: as likewise in the 29th and 30th epistles of his 3^d book; where we have the treatment of the Queen of Sweden, when labouring under this disease, by the celebrated *Hermannus Conringius*. And there (epistle 29.) we have mention made of a new scorbutic symptom, by *Otto Cæsius*, viz. a burning internal pain, seated in the mesentery, attended with violent drought, and colics most violent in the night.

Valentini Andreae Moellenbroecii, de varis, seu arthritide vaga scorbutica, tractatus. 1663.

He makes the scurvy a most universal disease, a calamity common almost to all mankind. Its immediate cause is, a volatile salt in the blood, endued with great acrimony and malignity. The last of these properties he thinks demonstrable, from the sudden weakness and prostration of strength, anxiety, and difficult respiration, that occur even in the beginning of the disease, as if the patient had swallowed poison; as also from an eruption of livid spots, which is often seen after death.

Thomæ Willis tractatus de scorbuto.

1667.

He sets out with telling us, that a great variety of symptoms, and disorders of the most opposite kinds, are supposed to proceed from the scurvy; which, like a condemned and infamous name, has the scandal of most diseases charged to its account. How far he clears up this confusion, or has abridged the number, will appear by the following detail he gives of scorbutic symptoms. He observes, that no single description or definition of this distemper can be given; and, consequently, that the best method of describing it, is according to the different

parts affected of the body; in all which it produces manifold symptoms.

He begins with the head: where the scurvy causes headaches, violent, and habitual; and sometimes vague, or periodical; oftentimes sleepiness, and dulness of the spirits, at other times obstinate watchings; frequent *vertigines*, *scotomiæ*, convulsions, palsies, salivations, ulcers of the gums, loose teeth, and foetid breath.

The breast is affected with pains in different parts of its membranes, chiefly on the *sternum*, where they are very violent, acute, and darting; frequent asthma's; difficult and unequal respiration; straitness of the breast; violent cough; inordinate pulse; palpitation of the heart; frequent faintings, and the continual dread of them.

In the *abdomen*, where this disease has its principal seat, it begets a multitude of evils, *viz.* *nausea*, vomiting, *cardialgia*, inflations and murmurings of the *hypochondria*, frequent colics, and most troublesome shifting pains; an almost constant *diarrhœa*, sometimes the dysentery, or *tenesmus*; the *atrophia*, and now and then the *ascites*. The urine is very often reddish and lixivial, having a cake suspended in it, or adhering to the sides of the glass: and sometimes, though seldom, a great quantity of pale watery urine is discharged.

In the limbs, or even over the whole body, there are wandering pains, often very acute, and becoming worse at night; a spontaneous lassitude; wasting of the flesh; *lumbago*, a weakness of the other joints; spots of various colours on the skin; tumours, tubercles, and often *coethic* ulcers; a *stupor* or stinging pain about the muscles; a sense of cold as it were in the parts; contractions and *subsultus* of the tendons. Besides these, scorbutic people are subject to irregular effervescencies of the blood, erratic fevers, and profuse hæmorrhages. He concludes this long detail with observing, that these are the most common and usual symptoms of the scurvy, sometimes more, sometimes fewer, of this or that kind, afflicting the

the diseased: but besides what have been already mentioned, there occur in it more uncommon and prodigious appearances.

The principal causes are, unwholsome air, and a vitiated *crasis* of the blood by preceding sickness. In this distemper, either the blood, nervous juice, or both, are affected. The *dyscrasy* of the blood is here twofold; either *sulphureo-saline*, or *salino-sulphureous*. If the first be the case, and the sulphurs superabound, then repeated bleedings, a cooling regimen, and the most temperate remedies, are proper; avoiding above all things the hot and acrid antiscorbutics. But, on the contrary, where there is the *salino-sulphureous diathesis*, and the salts of the blood are predominant, then the warmer medicines are proper, and such as are possessed of a volatile salt, together with steel and the like. The dyscrasy in the nervous juice is threefold. It is, *1st*, Either too thin and poor; or, *2dly*, It has degenerated from its spirituous saline constitution into a sharpness; or, *3dly*, It may abound with heterogeneous and morbid particles. And, according to these imagined dyscrasies of the blood and nervous juice, he makes a second distribution of the symptoms; and accounts for the whole number he enumerates in this disease, which he supposes to be hereditary and infectious.

The therapeutic intentions are divided into three classes. 1. The preservatory; under which he lays down the process of cure, or rather the method in general of removing the causes of the disease. 2. The curatory, or means of alleviating and relieving the most urgent symptoms. The 3d comprehends what he calls *the vital indications*, or the means of preserving and restoring the strength and health of the patient.

The preservatory intentions, or cure, consist in cathartic, digestive, and antiscorbutic medicines; with blood-letting occasionally repeated. If the stomach is much disordered, or oppressed with phlegm, he gives a vomit,

weaker or stronger, according to the strength or habit of the patient. This in some he repeats every month, where it is indicated: otherwise he begins the cure with a purgative, which he repeats occasionally, and of a different kind, suited to the warmer or colder constitution of the patient; or, to use his own terms, according as the *dyscrasy* of the blood is *sulphureo-saline*, or *nitro-sulphureous*. In both cases he furnishes us with variety of *formulæ*; observing, that they should be repeated no oftener than at an interval of five or six days; as too violent and frequent cathartics serve only to weaken the tone of the *viscera*, and strength of the patient, without removing the disease. After once or twice purging, if a fulness of blood, and its viscidty, make it necessary, the patient is to be bled in the arm, or with leeches in the hæmorrhoidal veins; rather repeating the operation, than taking away too much at a time. - Those evacuations being premised, according as they are severally indicated; provided there be no urgency from any particular symptom, he proceeds to the general method of cure, *viz.* removing the cause, and extirpating the disease. For these purposes, the digestive and specific antiscorbutic medicines (divided into two classes, *viz.* hot and cold) are to be given every day, unless when under physic; to which, if needful, diaphoretics and sudorifics may be joined. He calls these *digestive medicines*, which assist or restore the functions of the stomach, and other chylopoietic *viscera*; and *antiscorbutics* or *specifics*, such as remove the scorbutic dyscrasy of the blood: both which are to be joined together, or at least given the same day. *Cremor, sal,* or *tinctura tartari, tartar. vitriol. chalybeat. el. propr. &c.* are proper digestives. They are to be administered in a small dose, evening and morning.

For the cold scurvy, he abounds with an ample variety of antiscorbutic compositions, of *cochlearia, nasturtium aq. becabunga, cort. winteran. bacc. juniper. rad. rapha-*

ni, and other acrid aromatic herbs and roots, together with their conserves, the candied spices, *pulv. ari comp.* steel, &c. He has often successfully prescribed the following remedy. *R. sum. genistæ manip. iii. minutim incis. Coquant. in cerevis. fort. lib. iii. ad medietatem.* Two or three ounces to be given twice a-day.

In the hot scurvy, the more cooling and temperate antiscorbutics are necessary. Of these he gives the same variety; making use, in most prescriptions, of the *testaceous* powders, the absorbents, *sal. absinth.* &c. He recommends wines made of gooseberries, and other summer-fruits, but especially cyder: observes *rad. lapathi acuti* to be among the best of our antiscorbutics. This infused in ale, with brooklime, water-creffes, sliced oranges, citrons, pine-tops, &c. makes a noble remedy.

After having thus delivered the cure of the disease in general, he proceeds to the curatory indications for relief and removal of the most urgent symptoms. For a difficulty of breathing, and asthmatic fits, he recommends cardiacs and antispasmodics, *viz. sp. cornu cervi, tinct. castor. flor. benzoin. el. propr.* &c. given in any antiscorbutic liquor. If the *dyspnœa* be entirely spasmodic; opiates afford the greatest relief: acrid glysters, sudorifics, and diuretics, are likewise serviceable. In scorbutic disorders of the stomach, vomits, purges of rhubarb, *el. propr.* &c. with fomentations to the part, are necessary: opiates sometimes give ease. In scorbutic colics, glysters are to be given; fomentations, liniments, and cataplasms, used externally; and opiates internally, especially when joined with purgatives: the *testaceous* powders are proper; likewise the use of some purging mineral water, as *Epsom*. An inveterate *diarrhœa*, such as scorbutic persons are subject to, is not to be stopt by astringents: the mineral waters impregnated with steel and vitriol, are in this case the best medicines; and next to these, preparations of steel, especially its *crocus*. A *vertigo*, faintings, palsy, and convulsions,

vulsions, require a mixture of cephalic and antiscorbutic remedies. The other symptoms are to be treated likewise with such medicines as are proper for the original diseases compounded with antiscorbutics.

He afterwards relates a symptom which he had observed three or four times, *viz.* a crackling of the bones upon moving the joints. Even upon turning in bed, by rubbing of the *vertebræ* on each other, a considerable noise was perceived, like to the rough handling of a skeleton; which he remarks is an almost incurable symptom.

Lastly, We have what he calls the *vital indications*. He here directs the use of cardiacs, restoratives, opiates, &c. together with a proper diet. He blames the immoderate use of sugar in this present age, for the frequency and violence of the scurvy; and concludes with some histories of cases.

1668. *Morbus polyrhizos et polymorphæus.* A treatise of the scurvy. By *Everard Maynwaringe*.

To the causes of this distemper usually assigned by others, he adds the use of tobacco, and immoderate venery; particularly the first, which he inveighs against at great length. He runs down all former theories and methods of cure recommended by authors; pretending to be possessed of most effectual remedies; which, however, he does not make public.

1669. *Praxeos Barbettianæ, cum notis Frederici Deckers, lib. 4. cap. 3. de scorbuto, et affectione hypochondriaca malè vulgò dicta hysterica.*

Barbette gives a description of the scurvy, and its symptoms, pretty much from *Eugalenus*: cautions against bleeding, and violent purgatives, in the cure; but thinks gentle physic proper at times, and that the peccant humour should be prepared by inciding remedies; the most proper for this purpose being volatile salts.

salts. After a long list of the common antiscorbutic medicines, (to which *Deckers* subjoins many more, adapted to the particular symptoms of the disease), he observes, the *sp. sal. d. ammoniaci, et coqueleariæ*, are the principal remedies. He concludes with two cases: one a young man not able to walk through his chamber, who recovered in seven days by a decoction of *rad. raphani* in whey; another, a merchant, having scorbutic spots, who was cured by the use of *spir. sal. ammoniac.* and proper diet. *Deckers* adds another case, and seemingly a very genuine scurvy, which was removed by fourteen drops, for a dose, of the *sp. sal. ammoniac.* given in an infusion of *rad. raphani* in wine.

De scorbuto liber singularis; auctore Gualtero Charle- 1672.
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Observing it might be a task fit only for *Jove* himself to give an accurate account of the scurvy, and all its symptoms, he thinks it necessary to give only a catalogue of those which most frequently occur, and are the most afflicting. In this number he ranks almost all the symptoms enumerated by *Eugalenus*, *Sennertus*, and *Willis*; and afterwards distinguishes the disease itself into three kinds, from its different causes. The first is denominated a *rancid scurvy*, from the predominancy of the sulphurs in the blood combined with some of its salts; the second, a *scurvy from fixed salt*, where the tartareous or terrestrial saline particles prevail; and the third, an *acid scurvy*, owing to a sharpness and acidity of the blood and juices.

The symptoms peculiar to the first species, are, spots, *exanthemata*, pustles, tubercles, and ulcerations, upon the external parts of the body; internally *cardialgia*, vomiting, *diarrhæa*, dysentery, colics, together with frequent effervescencies of the blood. When this species of scurvy is inveterate, the *genus nervosum* becomes affected. The symptoms are then, a giddiness; tense headach;

headach; *scotomia*; *coma somnolentum*, or immoderate watchings; the night-mare, and sometimes madness.

Of the second species, the symptoms are, straitness of the breast, palpitation of the heart, and faintings numbness and lassitude of the body; convulsive motions and erratic pains in the joints.

In the third, or acid scurvy, there are continual irritations of the nerves; which are increased by the slightest passion of the mind; frequent *rigors*, (a certain sign of acidity in the humours); a sense of cold in the back part of the head, and spine of the back, sometimes running through the limbs; flatulent spasms; convulsions and what is commonly called the *hysteric passion*; sometimes costiveness; at other times the dysentery; melancholy, with dread and despair; atrophy; ulcerations lastly, a gangrene, which generally closes the scene. From this acidity in the blood, proceed likewise, palpitations of the heart; a sudden stoppage of the pulse, attended with great anxiety, ending in a faint, with a cold sweat. When this species of scurvy has become inveterate and confirmed, it begets most violent and dreadful symptoms, *viz.* intolerable nocturnal pains, cancers &c.

In the cure of the first species, we are to begin with gentle *cholagogue* purgatives prudently administered and repeated, and venesection, if the disease is but commencing; proceeding to the digestive or temperate alterative medicines, that may correct the hot *sulphureo-saline* state of the humours. If the patient be of a hot temperament, and lean, scurvygrafs, and other hot antiscorbutics, are to be avoided. Asses milk with juice of dandelion, or a water distilled from the milder antiscorbutics with cyder or cows whey, is then to be used. A pint of warm whey, with the addition of ten drops of *sp. cochlear.* or *sp. sal. d.* may be drank night and morning for some weeks together. The mineral waters are likewise serviceable; observing at the same time

time proper rules with regard to diet and exercise. After those courses, (during which the patient must take a purgative every week), the cure is to be completed by restoratives and corroborants. The best is, a small subacid wine, medicated with the temperate, but aromatic and stomachic antiscorbutics, or confections of the subacid fruits, &c.

For cure of the second species, proceeding from a fixed salt, the only proper medicines are those which abound with a volatile salt, *viz.* the warm antiscorbutics. Digestive and cathartic medicines must be interposed at times, together with sudorifics and diuretics, according to the tendency of the tartareous humour to the skin or kidneys. Steel mineral waters are to be used, if the patient is of a hot temperament. After those courses, recovery is to be perfected by corroborants and analeptics. The best of these is fennel-wine.

The cure of the third species, or acid scurvy, is to be begun with gentle *eccoprotics*, which make way for bleeding; proceeding afterwards to deobstruents, (such of this class as are mild), joined with temperate antiscorbutics, but especially such remedies as are proper in the hypochondriac disease with obstructed *viscera*. Afterwards antacids are to be given, *viz.* volatile salts of any kind, or the testaceous powders, lixivial salts, oily emulsions, and chalybeate medicines. Milk almost of any kind is proper; as likewise whey medicated with the temperate antiscorbutics; broths of snails, cray-fish, &c. The cure here, as in the before mentioned scurvies, is to be concluded by corroborants; such particularly as are recommended by authors at the close of the *melancholia hypochondriaca*.

He finishes his book with laying down the method of removing several of the most urgent symptoms in this disease. The principal of which are to be treated with remedies appropriated to such diseases when *idiopathic*, joined with antiscorbutics.

1674.

Francisci Deleboe Sylvii opera medica.

This celebrated author has little upon this disease but theory. He only observes, (*prax. medic. append. tract. 10. § 863. &c.*), that there is no distemper in which volatile salts are so efficacious and necessary as in the scurvy; herbs abounding with these salts, *viz. cochlear. erysim. nasturt. raphan.* and mustard-seed, being its best remedies. In imitation of those, for many years past he had given, with great success in this distemper, volatile salts obtained from different parts of animals. Moreover, acids that are spirituous, either of the natural or chemical sort, are likewise serviceable in the scurvy, *viz. juice of oranges, sorrel, &c. sp. sal. nitr. dul.* For cure of the scorbutic spots observed after the epidemical constitution, of which he is there treating, he mixed these volatile salts and spirituous acids together; which proved very serviceable, and sudorific.

1675.

The disease of London; or, A new discovery of the scurvy. By Gideon Harvey.

He divides the disease into two great branches, *viz. a mouth-scurvy, and leg-scurvy.* To which a third may be added, which he calls the *joint-scurvy.* They are thus denominated from the parts affected. The immediate cause of the first, is an acid lymph in the stomach; the occasional causes being the frequent use of mercury, a saline air, salt diet, brackish water used for brewing of ale, gluttony, debauchery, &c. The second, or leg-scurvy, he attributes to a cause opposite to that of an acid, *viz. a lixivial alcalious salt.* He terms it a *saponary state of blood.* The occasional causes of this are pretty much the same with the former, *viz. salt air and food; the use of sea-salt, distilled spirits, and tobacco.* An acid scurvy, upon its long continuance, changes into a saponary scurvy; or is followed with swelling and ulcers of the legs, &c. He afterwards makes many other distinctions in this disease, (see

part 1.

part 1. chap. 2. p. 43.). For a preservative against it, he recommends change of air, and wholesome, nourishing, easy-digested food. In the cure, bleeding is proper, and issues both for that and its prevention. In the mouth-scurvy, they are to be put in the left arm; in some cases in the neck, or right arm; in the leg-scurvy, above the knee; in the joint-scurvy, more than one are to be made. Aloetic pills are among the best preservatives against this distemper. They are to be premised in the cure of a recent, or even inveterate scurvy: but at the same time are proper only in the acid kind; as the laxatives in the lixivial or saponary scurvy must be of the mildest sort. The acid scurvy requires warmer medicines; the lixivial the more temperate, cooling, mucilaginous, &c. He concludes with the cure of a stomatic scurvy, hepatic, &c.

Abrahami Muntingii de vera antiquorum herba Britannica, ejusdemque efficacia contra stomacacen seu scelotyrben, Frisiis et Batavis de Scheurbuyck, dissertatio historico-medica. 1681.

He pretends, after much labour, to have discovered the true *herba Britannica* of the ancients, which had been unknown to the world for many ages, viz. that celebrated plant which, according to *Pliny's* account, cured the *Roman* army, (see p. 347.). He would have it to be *hydrolapathum nigrum*, the great water-dock; and bestows the most extraordinary encomiums upon it; giving instances of several remarkable cures performed by its use, in the scurvy.

Traité du scorbut, par L. Chameau.

1683.

The scurvy is in a particular manner endemic with the *English*, as the author had observed during his residence for some time among them; and for their sakes chiefly he published his book. He makes it to be a contagious dissolution of the blood, by a very acrid subtile

salt: confutes the distinctions made of the disease by Dr *Willis*, and extols milk as the most excellent anti-scorbutic; accounting all warm and acrid medicines for the most part pernicious.

1684. *Nauwkeurige verhandeling van de scheurbuik en des zelfs toevallen: or, A curious treatise on the scurvy, and its symptoms. By Stephen Blancard. Ejusdem praxeos medicæ cap. 15. de scorbuto.*

Though *Willis* and *Charleton* have written the best upon the scurvy, they have not yet solved all the difficulties that occur in it; which this author thinks he does by his theory of fermentation, founded upon the *Cartesian* principles. The malady proceeds from a thickness of blood. Of this there are two kinds, *viz.* a cold and pituitous viscosity; or there may be a heat and an acidity in that fluid: hence the disease is properly divided into a *hot* and *cold scurvy*. In the first species, whatever incides and attenuates viscid pituituous humours, such as the warm aromatics and spices; in the other (or acid scurvy), the *testaceous* powders, and all other absorbents; fixed, volatile, and alkaline salts; chalybeates, but particularly drinking of tea and coffee, are the proper remedies. Bleeding is of no use. Vomits and purgatives are sometimes necessary. All acids, viscid and salt foods, are pernicious.

1684. *Jo. Dolæi medicinæ theoretico-practicæ encyclopædiæ lib. 3. cap. 12. de scorbuto.*

The scurvy is a disease nearly allied to the hypochondriac affection, being an acid dyscrasy of the blood. He pretends to cure all scurvies in twelve days, by mercury dulcified in a particular manner.

1685. *Michaelis Ettmulleri collegii practici de morbis humani corporis part. 2. caput ultimum, exhibens duos affectus complicatissimos;*

complicatissimos; nempe, malum hypochondriacum, et scorbutum.

He accounts the scurvy the highest degree of the hypochondriac disease. All the symptoms of this latter occur in it, besides many more. He has nothing new, all he says being transcribed from other authors; but confounds the two diseases together, so as to make steel, and most other remedies proper in the hypochondriac disease, useful in the scurvy. He observes, that mercury is extremely pernicious in the scurvy; and so much dreaded in *Holland*, that even in venereal cases, they were afraid to use it, on account of their scorbutic constitutions. *Dutch* seamen carry to sea mustard-seed, which both preserves them from the disease, and cures it. In winter, when the antiscorbutic plants cannot be procured, a composition with mustard-seed is to be prescribed. *Phytolog. p. 98. Vid. Sinap.*

Thomæ Sydenham opera universa.

1685.

The author has no where treated expressly of this disease, but in a posthumous work ascribed to him, under the title of *Processus integri in morbis ferè omnibus curandis*. There the scurvy is said to be accompanied with, 1. spontaneous lassitude; 2. heaviness; 3. difficulty of breathing, especially after exercise; 4. rottenness of the gums; 5. foetid breath; 6. frequent bleeding at the nose; 7. difficulty of walking; 8. a swelling sometimes, at other times a wasting of the legs; on which spots always appear, that are either livid, or of a leaden, yellow, or purple colour; 9. a fallow complexion. For cure, eight ounces of blood are to be taken from the arm, provided there be no sign of a dropsey; next morning a purging potion given, and repeated twice, at the interval of three days betwixt each dose. On the intermediate days the following medicines are to be used, and continued for a month or two. *R. conf. cochlear. hort. unc. ii. conf. lujulæ. unc. i. p. ari comp. dr.*

dr. vi. syr. aurantior. q. s. F. elect. Of this the quantity of a large nutmeg is to be taken three times a-day, with six spoonfuls of the *aq. raphan. comp.* or *aq. cochlear. recent.* The patient is to have for common drink, an infusion of horse-raddish, scurvygrass, raisins and oranges, in small beer or in white wine. The above course is likewise beneficial in the scorbutic or hysterical rheumatism, bleeding and purging excepted. But the more genuine sentiments of this candid author are to be found in his other works.

Cap. 4. de febris continuis, ann. 1661, 62, 63, 64. He observes, that the two great subterfuges of ignorant physicians, were malignity and the scurvy; which they blamed for disorders and symptoms often owing to their own ill management. Thus, whatever bad and irregular symptoms have been brought on in fevers, perhaps by their unseasonable evacuations, these they ascribe to the malignity of the disease; but if the long continuance of the distemper should wipe off this aspersions of malignity, whatever afterwards obstructs the cure must be the scurvy; both of which are blamed without reason.

Sect. 6. cap. 5. de rheumatismo. To deliver my sentiments freely, though I do not at all doubt that the scurvy is to be met with in these northern countries yet I am persuaded it is not so frequent as generally supposed. For most of those disorders we term *scorbutic* are the effects of approaching ills not yet formed into diseases, or the relics of some disease imperfectly cured. Thus, for instance, where a matter suited to produce the gout is newly generated, there appear various symptoms, which occasion us to suspect the scurvy; till the formation and actual appearance of the gout remove all doubt concerning the distemper. And in the same manner, many symptoms ascribed to the scurvy afflict gouty people after the fit is over, especially if it has been improperly treated. And this is to be understood, not only of the gout, but also of the dropsy. The proverb is,

is, That where the scurvy ends, there the dropfy begins; which is to be understood in this sense, that, upon the appearance of the dropfy, the preconceived opinion of the scurvy falls to the ground. And the same may be said of several other chronic diseases that are but forming, and others that are not totally cured. He however thinks, there is a species of rheumatism near akin to the scurvy in its capital symptoms, and which requires the same method of cure. The pains shift from one place to another; rarely occasion a swelling; there is no fever; but it is attended with irregular symptoms; such especially as have taken much of the *cort. peruv.* are subject to it. Though it is otherwise a very tedious and chronic disease, yet it may be effectually cured by the use of the antiscorbutic electuary before mentioned, and a water distilled from scurvygrass, brooklime, cresses, &c.

Martini Lister tractatus de quibusdam morbis chronicis exercitatio 5. de scorbuto. 1694.

He treats of the scurvy next to the venereal disease, because they are nearly allied; having so many symptoms common to both, that they are not easily distinguished from each other, but by an experienced physician. The scurvy has not been expressly treated of by the ancients, as being in their time endemic only in a remote corner of the world little known to them. *Eugalenus* was the first who accurately described this disease. It was formerly confined to *Flanders*; but has acquired great strength since our navigation to the *Indies*, being now universal, and common to seamen of every nation. He ascribes it to the use of salt food, old saltish cheese, and the like; or it may be occasioned by ale made of brackish water. He observes the brewers have a bad custom of adding salt and quick-lime to their malt-liquors; which fines and preserves them without hops. He fancies the salt sea-air greatly productive of this

this malady; as he had been informed, that even salt rains fell in hot countries. Notwithstanding the great virtues ascribed to sea-salt by *Dioscorides*; yet it is plain that the ancients apprehended some ill effects from it when crude, by their burning, washing, and drying of it. He afterwards very ingeniously accounts for all the symptoms of the scurvy enumerated by *Eugalenus*; which he supposes to proceed from the use of this salt occasioning a brinish chyle, lymph, &c. and converting the whole humours of the body into a pickle. Juice of scurvygrafs, lemons, and oranges, all sorts of fruits and pot-herbs, (the more acid the better), are excellent remedies; as also vinegar, and *sp. vitriol.* He pretends to be the first who takes notice of fatal hæmorrhages sometimes occurring in this disease, and gives some instances of them from his *adversaria*.

1696. *Sea-diseases; or, A treatise of their nature, causes, and cure.* By William Cockburn.

The scurvy being generated by the salt provisions altogether unavoidable at sea, makes one of the constant diseases in navies. A fourth part of the seamen do not contract it directly, in declining from a state of health, but by being put too soon on the sea-provisions, after recovering from fevers, and other distempers. It attacks commonly the weak, lazy, and inactive. Refraining from the sea-diet, and living upon green *trade* (as it is called) on shore, proves an absolute cure. It is worthy observation, how suddenly and how perfectly they recover of this distemper by eating greens, *viz.* coleworts, carrots, cabbages, turnips, &c. Men put on shore in the most pitiful condition that can be imagined, are able in three or four days, by means of this food only, to walk several miles into the country. When Lord *Berkeley* commanded the fleet at *Torbay* in 1695, the author prevailed with his Lordship to erect tents for the sick on shore. Above a hundred of the
most

most afflicted scorbutic patients, perfect moving skeletons, hardly able to get out of their ships, were landed. They had fresh provisions given them, with carrots, turnips, and other greens. In a week they were able to crawl about; and before the fleet sailed, they returned healthy to their ships. He regrets, that this distemper had as yet been left without a remedy at sea. If proper care was taken about their diet, seamen would not be so liable to it. He condemns the division into a hot and cold scurvy made by Dr *Willis*. The first alone is properly the true and real scurvy, and the latter nothing else but the *melancholia hypochondriaca*. And upon this occasion he observes the necessity of having proper names and descriptions of diseases; as the use of ambiguous terms is apt to mislead, and to have fatal consequences in the cure of them.

Archibaldi Pitcairni element. medicinae physico-mathematicae. lib. 2. cap. 23. de scorbuto.

The reader must here be cautioned, that every thing in this posthumous work is not to be ascribed to *Pitcairn*. The symptoms of the scurvy are said to be, a redness, itching, putrefaction, and bleeding of the gums; loose teeth; spots on the legs, first red, then livid, and blackish; an unusual lassitude; a red sandy sediment in the urine, so that it appears lixivial; an unequal pulse; wandering pains; toothachs; redness, or heat of the body; foetid breath; fluxes with or without blood. The immediate cause is, a broken texture of the blood; and this dissolution of that fluid may be occasioned even by bleeding; which is by no means proper for scorbutic people. But he talks only of the hot scurvy, or what *Willis* terms the *sulphureo-saline*; this being properly the disease, if we would distinguish it from the hypochondriac affection. He recommends milk, or a milk-diet, as the best cure. But if it does not succeed, or any thing forbids its use, then chalybeates are to be given,

with the addition of astringents, and the fixed temperate antiscorbutics, especially if faintings, fluxes, or a difficulty of breathing, afflict the patient. In the wandering gout, or scorbutic pains, after gentle purging, *decoct. guajac. et sarsaparill.* is to be administered; observing, that if these pains are attended with few or no other scorbutic symptoms, they are then to be deemed rheumatic. This may easily be discovered by their admitting of repeated and plentiful bleedings; which are so very hurtful in the scurvy. Next to a milk-diet, chalybeates, decoction of the woods, and *succ. antiscorbutic*; nothing will prove so effectual as the transfusion of the blood of a sound animal into a scorbutic patient,

1708. *Hermanni Boerhaave aphorismi de cognoscendis et curandis morbis. Aph. 1148. &c. de scorbuto.*

Besides the common causes usually assigned by authors as productive of the scurvy both at sea and land, he, from Sydenham, adds that particular of having taken too great a quantity of the *cort. peruv.*; then describes the symptoms peculiar to the malady in its beginning, progress, and more advanced stages, contained in the four following sections.

Sect. 1. An unusual laziness; an inclination to rest; a spontaneous lassitude; a general heaviness; pain of all the muscles as after too great a fatigue, particularly in the legs and loins; an extreme difficulty in walking, especially up or down a steep place; in the morning, upon awaking, the limbs and muscles feel as if wearied and bruised. *Sect. 2.* A difficulty of breathing, panting, and almost suffocation, upon every little motion; a swelling of the legs, often disappearing, and an inability to move them, from their weight; red, yellow, or purple spots; a pale tawny colour in the face; a beginning stench of the mouth; a swelling, pain, heat, and itching of the gums, which bleed upon the least pressure; bare and loose teeth; pains of different sorts, wandering, in

all

all parts of the body, external as well as internal, occasioning surprising anguish, resembling pleuritic, stomachic, iliac, colic, nephritic, cystic, hepatic, and splenetic pains. Hæmorrhages occur in this stage, but slight. *Señ. 3.* A deadly stinking rottenness, inflammation, bleeding, and gangrene of the gums; loose, yellow, black, and carious teeth; varicose veins under the tongue; hæmorrhages, frequently mortal, from under the skin, without any apparent wound; as also from the lips, stomach, liver, lungs, spleen, *pancreas*, nose, &c.; ulcers of the worst kind upon every part of the body, chiefly the legs, yielding to no remedies, of a gangrenous disposition, and most foetid smell; *scabies*; crusts; a dry and gentle leprosy; violent, piercing, universal nocturnal pains; livid spots. *Señ. 4.* Fevers of many sorts, hot, malignant, intermitting all manner of ways, vague, periodical, continued, occasioning an atrophy; vomitings; *diarrhææ*; dysenteries; severe stranguries; faintings; and an oppression upon the *præcordia*, often suddenly mortal; a dropsy; consumption; convulsion; *tremor*; palsy; contraction of the sinews; black spots; vomiting and purging of blood; putrefaction of the liver, spleen, *pancreas*, and mesentery.

He supposes the immediate cause of the distemper to be a singular state of blood; in which part of that fluid is too thick and viscid; while, at the same time, the other, *viz.* the *serum*, is too thin or dissolved, saltish and acrid. Which latter, or its acrimony, is either of an acid or alkaline quality: a distinction here carefully to be remarked. Upon this hypothesis he founds the following therapeutic rules, *viz.* That part of the humour which is too thick, viscid, and stagnating, must be attenuated, rendered thinner, and put in motion; mean while, what is already too thin, is to be inspissated, and the predominating acrimony corrected according to its different kind and species. Now, as a singular regard must be had at the same time to these so opposite intentions of cure, he

thinks it the master-piece of art to cure the scurvy. And after observing that smart evacuations always exasperate, and often render it incurable, he lays down the following process, adapted to the different stages and symptoms, as distributed in the four classes or sections.

In the first stage (see sect. 1.) we are to begin with a gentle, attenuating, deobstruent purgative, often repeated in a small dose; next, to proceed in the use of attenuants, and what are called *digestive medicines* (a); concluding with a long continued course of the milder specifics, exhibited in almost any form. In the second stage, (sect. 2.), all that has been mentioned is necessary, with the addition of the more acrid antiscorbutics. Baths for the body and feet, prepared with antiscorbutic ingredients; also hot, dry friction, and often blood-letting, for certain reasons he mentions, are proper. According to the acrid thinness of the fluids, heat, or danger of a hæmorrhage; or, on the contrary, the viscosity and inaction of the humours, paleness, coldness of the body, &c. the antiscorbutics given, are to be moderately astringent, somewhat cooling, or hot or acrid. In the third species or stage, (sect. 3.), all the already prescribed measures are to be used. The patient is also to take great quantities of soft antiseptic, antiscorbutic liquors, promoting for a considerable time gentle evacuations, by sweat, urine, and stool. In the fourth stage or species, (sect. 4.), the case is for the most part incurable; medicines are to be varied according to the different symptoms; sometimes mercurials do service, as likewise what was ordered for the third species.

He concludes the subject with observing, that, in order to a successful cure of this disease, it is principally required to investigate the peculiar predominating acrimony in the humours: and as this acrimony may be

(a) Vid. *Willis*. It is needless to give *Boerhaave's* prescriptions here, as almost all of them in his *Materia medica* are taken out of *Willis*; as is indeed his process of cure.

either saline and muriatic, acid and austere, alkaline and foetid, or rancid and oily; so it requires different and opposite cures; what is serviceable to one scorbutic patient, proving poisonous to another. The name of the distemper is not so much to be studied, but each particular species of it, according to the different kinds of acrimony above specified, as if it was a distinct disease.

Jo. Henrici de Heucher cautiones in cognoscendo curandoque scorbuto necessariae. 1712.

This pamphlet contains some of the most exceptionable doctrines of *Willis, Eugalenus, &c.* Of which the following may suffice as a specimen. Mercury is very justly sometimes recommended in the scurvy by *Boerhaave*, when it is accompanied with fevers of various kinds, vomiting, *diarrhœa*, dysentery, violent stranguries, faintings, and anxieties, often mortal; dropsy; consumption; convulsions; palsies; voiding of blood; putrefaction of the liver, spleen, *pancreas*, and mesentery.

An account of the scurvy at Wiburg. Communicated by Dr Abraham Nitzsch to Dr Schulze. 1732.
Commerc. literar. 1734.
Norimb. ann. 1734, p. 162.

It may be proper, first, to observe, that the scurvy is here an endemic *lues*. But what drew particular attention to it this year, 1732, was the uncommon number of the afflicted, and of those who died, together with its unusual duration. It persisted in its ravage from the beginning of the year until the month of *August*, with such remarkable violence, that I was sent thither by express orders in the month of *June*. I observed the appearances of the disease were not the same in all; but different in individuals, according to their constitution of body.

Those who were of a lax habit, laboured under an œdematous swelling of the legs, (rarely of the *abdomen*), yielding easily to the impression of the finger, but often becoming

becoming harder upon the continuance of the malady. The *hypochondria* for the most part were tumid, the flexor tendons of the *tibia* always contracted, with livid spots on the legs, knees, thighs, and back. These in plethoric habits, particularly upon the *tibia*, became often inflamed, attended with most acute pain, and quickness of the pulse. Now and then the white of the eye was altogether bloody; and sometimes the eye-lids were greatly swelled, being distended with extravasated, stagnating blood. In some the spots were pretty large, especially upon the thighs and back; in others they resembled only flea-bites, and were accompanied with swelling of the legs, universal lassitude, swelled, bleeding, and putrid gums; as also a pale wan countenance. Several were distressed with a great difficulty of breathing, moist cough, a *vertigo*, and faintings, most commonly when in an erect posture; the latter often proved fatal to those who had been long afflicted. The appetite from the beginning was somewhat impaired, often leaving the patient upon his being affected with *borborygmi* and *nausea*, but returning upon the accession of a *diarrhœa*. The feet, *scrotum*, and *abdomen*, were sometimes greatly distended with a transparent watery swelling, and the skin inflamed. The gums having become a mass of spongy flesh, discharged, upon squeezing, a foetid *ichor*; and the salivary glands were sometimes so stuffed, as to acquire the hardness of a scirrhus, which could not be resolved by any other means than by a natural and spontaneous salivation.

Persons of a dry habit were afflicted with symptoms different from those of repletion. They were every day more and more emaciated, and racked with violent shooting pains on the *tibia*, accompanied with a fever. The anguish did not fix in one place, but by shifting produced arthritic pains, colics, the spasmodic asthma, headaches, toothachs, and contractions. By the use of improper volatile medicines, the abdominal *viscera*, the
liver

liver and spleen, became hard; upon which ensued either an *ascites*, or an atrophy and *diarrhœa*, which constantly proved fatal. The gums were swelled and hard, painful to the touch, and often over-run with a cancerous ulceration.

In order to put a stop to this dreadful calamity, it was necessary that the treatment and remedies should be suited to the habit and constitution of the patient. I therefore prescribed for those who laboured under the slow or cold scurvy, a decoction of *sum. pin. bacc. juniper.* and *trifol. fibrin.* Where there was reason to apprehend a swelling of the abdominal *viscera*, I gave the neutral salts, and alkaline tinctures; but where there was a fever, and inflammation on the *tibia*, the saline nitrous absorbents internally, and externally *sp. vin. camp.* with saffron. For the stiff tendons I used *ung. nervin. cum ol. philosop.* &c. and baths; for the swelled, bleeding gums, *ung. Ægyptiac. mel. ros.* and *spir. cochlear.* or *tinct. gum. lacc.* and *sp. coch.* or common water acidulated with *sp. vitriol.* The air was corrected three times a-day by a fume of juniper wood and berries. The *paracentesis* often succeeded with those who had the *ascites*, when free from a fever, and an œdematous swelling of the abdomen. It restored them to perfect health; as did also scarifications upon the calf of the leg and *scrotum*, when there appeared a tense watery swelling upon these parts; provided proper internals were administered, *viz.* aperient, diuretic, and strengthening medicines, such as *tinct. tartar. mart. antimon.* neutral salts, &c. If there was any danger of a gangrene from these scarifications, as often happened, it was stopped by nervous and antiseptic applications.

In the painful scurvy, upon account of the dry habit of body, medicines heating and exagitating the blood, formerly given, were laid aside, and emollient remedies were prescribed, *viz.* a decoction either of barley or oats; or of *rasur. cornu cervi*, with *rad. scorzon. summit. millefol.*

millefol. et flor. chamemel. : as also oily medicines, *viz. ol. amygd. d. et sperm. ceti*; which often miraculously allayed arthritic pains, and the oppressive complaints in the breast. Antispasmodics were sometimes given, *viz. nitr. depurat. cinnabar. antimonii*, epileptic powders, &c. and occasionally absorbents, and the *testaceous* powders. When the *hypochondriaca* were obstructed, *rad. cichor. vel tarax.* was added to the decoction : and for the swelling, heat, and pain of the gums, the pulp of citron proved an excellent and agreeable remedy. By this treatment, and the blessing of Heaven, I put a stop to the calamity ; infomuch that the number of the diseased, and of those who died, diminished every day, and in the space of a month it quite disappeared.

This present year, the *Cuirassiers* lately come from the *Ukraine* to *Petersburg*, have furnished me with several farther observations upon this disease. The symptoms were as usual. It was always a salutary sign when the spots appearing continued out. In two cases their sudden disappearance proved fatal. Besides the use of the attenuating decoction before mentioned of *sum. pin.* I found it necessary, every second or third day, to give a half-spoonful of a mixture prepared of *gum. ammoniac. el. propriet. ana p. æ.* diluted with *sp. vin. tartarizat.*; or *pulv. salin. dr. fs. cum diagrid. gran. iv. vel v.* : which had so remarkable good effects, that though many were cachectic, yet none became dropsical. Prudent blood-letting near the decline of the disease, when the pulse was strong, evidently assisted in the cure. I can solemnly affirm it was followed with an increase of strength, a perfect relaxation of the tendons, which had before been attempted to no purpose by warm steams and baths, and a more speedy recovery. The disease left us in *May*, having acquired its virulence in *February*.

1734. *Observationes circa scorbutum; ejusque indolem, causas, signa, et curam. Auctore Joanne Fred. Bachstrom.*

From

From want of proper attention to the history of the scurvy, its causes have been generally, though wrongfully, supposed to be, cold in northern climates, sea-air, the use of salt meats, &c.: whereas this evil is solely owing to a total abstinence from fresh vegetable food, and greens; which is alone the true primary cause of the disease. And where persons, either through neglect or necessity, do refrain for a considerable time from eating the fresh fruits of the earth, and greens, no age, no climate or soil, are exempted from its attack. Other secondary causes may likewise concur: but recent vegetables are found alone effectual to preserve the body from this malady; and most speedily to cure it, even in a few days, when the case is not rendered desperate by the patient's being dropical or consumptive. All which is founded on the following observations.

He remarks, that the scurvy is most frequent among northern nations, and in the coldest countries. There it is not confined to the sea alone, but rages with great violence at land, afflicting both natives and foreigners; of which the poor seamen left to winter in *Greenland*, who were all cut off by this distemper, afford a memorable instance. But the opinion of its being produced there by cold, he thinks irreconcilable with the daily experience of its attacking seamen in their voyages to the *Indies*, even when under the torrid zone.

That it is not peculiar to the sea, the following histories sufficiently evince. During the late siege of *Thorn*, above 5 or 6000 of the garrison, besides a great number of the inhabitants, died of this distemper; the surrender of the town being more owing to the havock made by this dreadful calamity, than to the bravery of the besiegers. Upon which he observes, that, allowing this disease to be most frequent among the northern nations in winter, yet the siege of that place was carried on in the heat of summer; and the *Swedes*, the besiegers, a northern nation, kept altogether free from the scurvy.

The mischief first attacked chiefly the blockaded *Saxon* garrison. They being almost all cut off, the inhabitants were at last obliged to do duty upon the walls; of whom it also destroyed a great number. But no sooner was the siege raised, and the gates of the town open for the admission of vegetables and greens from the country, but the mortality quickly ceased, and the disease at once disappeared.

In the end of the last war with the *Turks*, when the Imperial army wintered in *Hungary*, the country having been laid waste about *Temeswaer*, by the calamities of the preceding war, many thousands of the common soldiers, (but not one officer, as having different diet), were cut off by the scurvy. The physician to that army employed his utmost skill, and the most approved antiscorbutic remedies. Notwithstanding which, the mortality went on increasing during the winter. Unacquainted with the disease, or rather its remedy, he demanded a consultation of the college of physicians at *Vienna*; whose prescriptions and advice were of no service. The disease still persisted with increasing virulence until the spring, that the earth was covered with greens and vegetables. And the physician now rejoiced as much in having found out the true cause of this evil, as before he had regretted his unhappy disappointment in the removal of so general and dreadful a calamity.

As some are of opinion, that warm and inland countries are altogether free from this distemper, he gives an account from an officer of a *German* garrison in *Italy*, many of whom were cut off by it at a great distance from the sea. The officer himself, an *Italian*, was miserably afflicted, and given over by his physicians, who were altogether ignorant of his case; when a *German* surgeon, by lucky accident passing that way, rescued him from the jaws of death. He cured him in a few days, to the surprise of his physicians, by ordering his servant to the fields to supply him with green vegetables,

getables, especially the *sifymbrium*, which grew thereabouts very plentifully.

The following relation is no less curious. A sailor in the *Greenland* ships was so over-run and disabled with the scurvy, that his companions put him into a boat, and sent him on shore; leaving him there to perish, without the least expectation of a recovery. The poor wretch had quite lost the use of his limbs; he could only crawl about on the ground. This he found covered with a plant, which he, continually grazing like a beast of the field, plucked up with his teeth. In a short time he was by this means perfectly recovered; and, upon his return home, it was found to have been the herb scurvy-grafs.

From all which the author concludes, that as abstinence from recent vegetables is altogether and solely the cause of the distemper, so these alone are its effectual remedies. Accordingly he bestows the epithet of *antiscorbutic* on all of that class which are wholesome and eatable; observing Nature every where affords a supply of remedies, even in *Greenland*, and the most frozen countries. There no sooner the snow melts from the rivers, but their borders are covered with brooklime, cresses, and scurvygrafs, in ample prodigality. There Nature dictates to those barbarous nations, that what she thus blesses them with in such bounteous profusion, affords present health and relief in their malady. This all physicians acquainted with the nature of the scurvy, must be likewise sensible of. The most common herbs and fresh fruits excel the most pompous pharmaceutical preparations, especially those of the animal and mineral kinds. He divides antiscorbutics into three classes. The first contains the common pot-herbs, and all plants of an insipid, or rather sweetish taste, fruits of trees, &c. of this quality; and when in want of those, even grass itself may be eat. In the second class, he ranks all vegetables, roots, fruits, berries, &c. that are of a sub-

acid or acid taste : and these being of a middling quality betwixt the insipid plants of the first class, and the stronger bitters he includes in the third, they will prove more effectual than the first, without being liable to some inconveniencies which may attend those of the third class. In this last he comprehends all fresh herbs, roots, and fruits, of a bitter and strong taste, of the nature of scurvygrafs, cresses, &c. These last are with caution to be prescribed at first, or in great quantities. For prevention, he recommends living much upon green vegetables, when they can be got; otherwise, upon preserved fruits, herbs, roots, &c. He advises seamen when at land to be more careful of laying up a store of greens than of flesh; and, in case of necessity, would have them when at sea to make trial of the sea-weeds that grow upon the ship's bottom; being persuaded, that the great physician of nature had not left them without a remedy, although he had never heard of its being tried (*b*). After a long abstinence from vegetables, the diseased are to begin with the milder antiscorbutics, proceeding by degrees to those of a stronger nature. In examining the mineral and fossil remedies, which have been so much recommended in the scurvy, he observes of nitre, that as it is a copious ingredient in most plants, perhaps it may be serviceable; but, otherwise, all of those classes are to be avoided. He condemns the use of steel, mercury, and alum; as likewise sulphureous and vitriolic medicines, especially the strong acid of vitriol, which some account a specific in the scurvy; but they will find themselves disappointed.

1734. *Parerga medica conscripta à Damiano Sinopeo.*

In *Cronstadt*, which is a low marshy island, and where the weather for the most part is cold, rainy, and cloudy, the scurvy is an endemic and common disease. It is most frequent and violent in the beginning of spring;

(*b*) I am informed they were tried in Lord *Anson's* ship.

but

but much rarer and milder during the rest of the seasons, unless the weather prove cold and wet: and for the same reason it is more frequent some years than others.

The symptoms are, a putrid swelling of the gums, lassitude, and a remarkable pain and weakness of the legs; swelling of the feet and knees; contraction of the tendons; a cachectic, and, as it were, anasarcaous habit of body, with a dark yellowish hue; costiveness, and a thick lateritious urine. After those appearances, ensue pain, and even contractions of the upper extremities; livid spots of different sizes; pains in the shoulders, and small of the back. These latter prove very violent in such as are tainted with the venereal poison. Few die of this distemper; for the most part only those who have become consumptive or dropsical.

The learned author, in his very elegant and accurate account of the diseases which prevailed at *Cronstadt*, from the year 1730 to the end of 1733, observes, that when he first came there, *ann.* 1730, true pleurisies, peripneumonies, &c. reigned. Those acute fevers ceased with the spring; and an unusual dry and warm summer succeeding, there were few acute diseases, and even old chronical ailments became more tolerable. A dry and cold autumn, with a seasonable snowy winter, gave rise to but very few acute diseases; till about the beginning of *February*, when a catarrhal fever commenced. The weather proved then very unsettled; the spring was cold and moist; and the summer much the same, with little heat. This catarrhal fever raged about twenty days. Upon its remission, pleurisies, peripneumonies, rheumatisms, &c. took place; and an intermitting fever, which continued the whole spring; as also the scurvy. This last made its appearance in the month of *March* 1731, seizing at first only a few; but in a short time the number of scorbutic patients was equal to those in fevers; and afterwards exceeded them, the fevers then ceasing. It began with a bloated fallow complexion,

plexion, livid spots, &c. and was accompanied with such symptoms as have been before mentioned. In the months of *April* and *May* it raged with uncommon violence, and continued almost till the middle of *July* when it was abated by the heat of the season. Some patients became anasarcaous, or dropsical; others phthysical. Some laboured under the most violent colics, with obstinate contraction of the belly; others were seized with a *sphacelus* of the gums and *fauces*, scorbutic tumours, &c. Soft livid swellings arose upon the body: they were judged to be full of matter; but, upon opening them, nothing was discharged but a blackish dissolved blood: the ulcer was surrounded by a fungous rotten flesh, whose basis seemed very deep, and bled upon the gentlest touch (c).

Although the scurvy was a distemper bad enough of itself, it was, however, often rendered worse by being complicated with other intercurrent diseases, viz. fevers, and rheumatisms, but especially the intermitting fever. All who recovered from this last, became scorbutic. There was scarce any person, either in the hospital or town, who laboured under even a chronic disease, who was not more or less affected by the scurvy. Hence all diseases whatever became more troublesome and obstinate this spring.

The scurvy having entirely ceased in *July*, a few mild fevers took place the rest of the summer, and autumn.

In the beginning of the year 1732 a gentle vernal fever prevailed; soon after, the *pleuritis spuria* was more frequent; and, lastly, the scurvy. All those diseases entirely ceased upon the appearance of a warm and dry summer. This continued but for a month, when the weather changed to rain and cold; which induced a u-

(c) A very accurate description of scorbutic tumours and ulcers. Compare it with *Poupart's*, p. 315. *Dr Huxham's*, p. 92. and other observations, p. 169. &c.

universal distemper, viz. a catarrh, with cough, &c. It spread itself over all the countries about, raged much at *Petersburg*, and affected even those who were at sea.

After many curious observations foreign to our purpose, he remarks, that the vernal scurvy, *ann. 1733*, was milder than any of the former; but, nevertheless, contrary to custom, continued during the whole summer and autumn, the seasons proving wet and uncomfortable. He has one singular observation, That the *scabies* and *purpura* prevailed at the same time with the scurvy. The remedies used, were, essences and conserves of the antiscorbutic plants, hot aromatics, bitters, &c. The author gave many medicines; but, unluckily, few or none that were truly antiscorbutic.

Jo. Geo. Henrici Kramerii dissertatio epistolica de scorbuto. 1737.

The case of the Imperial troops in Hungary; transmitted to the college of physicians at Vienna, by the author. 1720.

The calamity which afflicts the Imperial troops, is not that species of scurvy described by *Eugalenus* and others. It differs from it in three particulars.

1st, It is not infectious. No officers are seized with it; and only the regiments of such nations as use too gross a diet. 2^{dly}, It is not a primary, but a secondary disease. It attacks only those who have recovered from fevers, and especially such as have had frequent relapses. 3^{dly}, It is not attended with the many symptoms described by those authors. The appearances in all are constantly uniform, and as follow.

In the first stage the gums are swelled; they are apt to bleed, and stained with livid spots. Upon which ensue, great putrefaction, a most offensive stench from the mouth, and a falling out of the teeth.

In the second stage or degree of the malady, there is for the most part a contraction of the joint of the knee, so that the patient cannot extend his leg. Violent shoot-

ing

ing pains are felt in this joint, as likewise often on the other joints of the body. The contracted knees are also swelled, with incredible pain and *rigor* of the tendons; and the skin is covered with bluish extravasations, interspersed with small miliary eruptions. In one night's time the eyes, and even other parts of the body, are covered with large livid spots, as if the patient had received several bruises. These spots are altogether without pain. The muscles of the legs, thighs, and even cheeks, become greatly swelled, and hard, nay, altogether indurated. But those swellings, as also the large *ecchymoses*, never suppurate. The pulse is quick, small, and hard; the urine red, with a thick unequal sediment.

If the patient still continues the use of improper diet, as is the case of many of our common soldiers, from want of necessaries and conveniencies in *Hungary*, the malady advances to its third stage. The gums become prodigiously swelled, together with the cheeks. A gangrene, or *caries* of the jaw, ensues; both which prove incurable. The difficulty of breathing is so great, that the patients not only faint away upon the slightest motion of the body; but frequently, when walking about, drop down suddenly dead. They generally complain excessively of this *dyspnœa*, a few days before death, though they have neither cough nor spitting. All the species of dropsies, and œdematous swellings on the body, accompany the advanced stages of this calamity; in so much that, by lying with the head in a declining posture, the face in half an hour becomes so swelled, that the person cannot open his eyes. Such swellings often disappear and return. They are subject to profuse hæmorrhages from the nose; and, in these deplorable circumstances, to a *diarrhœa* or dysentery, which often closes the scene. In the beginning of the disease, the appetite and thirst are natural; but towards the close of the malady, the appetite fails, and the thirst is increased. Of the many other symptoms described in this disease by authors, none else

else occur but those alone which have been mentioned.

This is the fatal mischief which destroys many miserable wretches in *Hungary*, at farthest in the space of two or three months, but for the most part in three or four weeks. If the patient survives till the summer, he either perfectly recovers, or remains incurably contracted.

The remote causes of this evil are, relapses after tedious fevers, which have been epidemic in the country; the moist and marshy soil; but especially gross and viscid diet, *viz.* flesh, and the grosser farines, coarse heavy bread, and pudding, (or a food called *rollatschen*), eaten by the *Bobemians* more than by all others. They are almost the only nation affected. One thing remarkable is, that this disease does not appear in *Hungary* in summer, autumn, nor in winter; but every year in the beginning of spring.

I come now to what has been attempted, both by myself and others, towards the cure: And must first observe, that 400 of the troops near *Belgrade* having taken mercury without my advice, the dreadful consequence was; they all died in a salivation! Shunning therefore that fatal drug, I generally premised a vomit, on purpose to clear the first passages, and so to procure a more certain entrance of the specific antiscorbutics, with their full virtues, into the blood. I then administered, in every form that could be thought of, or that has been recommended by authors, the most approved antiscorbutic remedies, *viz.* *Radices, raphan. taraxic. ari. asari, gentianæ, angelic. helen. acori, sarsaparill. chinæ, &c.* *Folia, et herbæ aridæ*, (for here the green fresh plants cannot be procured), *becabung. nasturt. trifol. fib. cochlear. acetos. scordii, rutæ murar. rosmar. saly. cent. min. sedi minim. &c.* *Ligna guajac. sassaparil, &c.* *Strobili pin. Cortices winteran. guajac. aurantior. Baccæ juniperi, lauri, &c.* I have also given salts of every kind, volatile and fixed, particularly *sal. vol. cornu cervi, arcan.*

arcan. duplicat. sal. tartar. fix. sal. ammoniac. crud. cremor tartar. with chalybeates of all sorts. *Spir. sal. ammon. sal. vol. ol. spir. et tinct. tartari, tinct. bezoard. spir. cochlear. &c.* In place of the juice of citrons and lemons, which cannot be got here, I gave *acet. theriac.* or vinegar, in which many of the before mentioned ingredients, particularly the celebrated *rad. armoraciæ*, were infused. I was not sparing of the most costly medicines, *tinct. mart. antimonii, lunæ helvet. &c.* But, alas, all was in vain!

In a word, there is nothing that has been recommended by the best classical and standard authors (*d*), which I have not made trial of, except the juices of the fresh green plants, and their quintessence recommended by *May* (*e*). It is not in my power to procure those herbs, or their juices; because, as I observed before, they do not grow in this country. We have nothing here but *eruca lutea* (wild rocket), and *rapistrum arvorum* (wild mustard); but even of these, who can gather a sufficient quantity for such a number of the distressed? Milk, were it proper, cannot be purchased for so great a multitude of people: and the same may be said of whey.

After having met with such melancholy disappointments, in the trial of what has been recommended by others, and whatever I could think of myself; reflecting that tedious fevers had generally preceded, and that a slow fever still accompanied the disease, I fell upon the *cort. peruv.* given in the form either of electuary or infusion. By this, in a few days, I cured sixty soldiers in the regiment of *Bagnan*, who were in the second stage of the disease. It is now two years ago; but at the same time they had a proper diet, and such food as cannot at this time be procured. I have lately tried *sem.*

(*d*) Here he enumerates sixteen modern writers on the scurvy, of the greatest repute, with an *&c.*

(*e*) A medicine of *Dr Michael's*. Vid. p. 183. The author afterwards observes, that it was of no efficacy.

sinap. Mustard-seed is said to have saved the besieged garrison of *Rochelle*, when over-run with this disease; but here, like all other remedies, it is of no efficacy. I need not say any thing of topical applications: as such powerful internal helps do not avail, little can be expected from them. I shall only observe, that different regiments have used the baths of the country; but all to no purpose.

I therefore humbly request, that if any of you, gentlemen, are possessed of an *arcanum*, or a remedy able to overcome this *Herculean* disease, you would favour me with it; as also your best advice. Perhaps some of you may have the knowledge of the fixed mercury boasted of by *Dolæus* and *Helmont*, which will cure the scurvy without the aid of such a proper diet as cannot at this time be procured for the wretched in *Hungary*.

A copy of this case of the troops was delivered to each member of the college at *Vienna*; and, by order of the Dean of Faculty, all were desired in three days time to give in their opinion in writing. Which produced the following answer.

We have received your very accurate account of the scurvy, which commits such dreadful havock among the Imperial troops during the spring in *Hungary*; and it is ordered directly to be printed. After having had all circumstances duly weighed by the most experienced of our faculty, the first rule we prescribe, is, great attention to the non-naturals. Without this, the most heroic medicines may fail; but when a proper regard is had to these, simple remedies will do great things. As the sources of this calamity seem to be impure air, and an unwholesome marshy soil, (evils not easily remedied); the troops must often shift their quarters, and be removed into better air. When in unhealthful stations, they are, by way of prevention, to use the smoak of tobacco, juniper, &c. They should have always dry straw to lay upon

the ground; and as wholesome food as can be provided for them.

As to the cure, (after noting with infamy those who have recommended a mercurial salivation in this disease, as more properly destroyers of the human race than physicians), we would advise a gentle vomit of *ipeca-cuan.* to be premised; and afterwards the approved antiscorbutics of the vegetable kind to be given, *viz. cochlear. becabung. nasturt. fumar. flor. hyperic. trifol. fibrin. &c.* The juice, extract, tincture, decoction, &c. of these, may be administered either in whey or broth. As you have none of those plants, we have sent you their seeds to be sown in the country; and until such time as they grow up, have supplied you with a quantity of the dried herbs, and of their inspissated juice. Besides which, we would recommend two remedies of great and experienced virtues (*f*).

The author's farther explanations and experiences.

The scurvy attacked only those who, after frequent relapses, and recovery from fevers, used a crude viscid diet. Hence not one officer was seized with it; nor even any of the common men among the dragoons, as their pay and living were better. It was always accompanied with remains of the fever in the pulse and urine. Both in *Hungary*, and in *Piedmont*, where the troops were lately afflicted with it, the natives were at the same time altogether free from it. The disease occurs oftentimes in *Germany*, among such people as live altogether on the boiled pulses, without eating any green vegetables or summer-fruits. In the hospital at *Dresden* there are scorbutic patients every year. It is a fatal mischief often in besieged towns, as also to seamen in long voyages. It is, however, quickly cured in cold countries; as in *Green-*

(*f*) The one a paste of *pulv. rad. chin. sarsaparil. et bordei*, from *Hoferus*; the other, a distilled antiscorbutic water, from *Zwingerus*. The author afterwards observes they were of no efficacy.

land, by scurvygrafs; and in warmer countries, by the juice of oranges. Dutch failors effectually prevent this distress, by eating once or twice a-week pickled cabbage. When blood was injudiciously drawn for relief of the scorbutic *dyspnœa*, there was no separation of the *serum*: it was covered a-top with a white greasy film. The contraction occurs in no other joint but the knee. The disease constantly begins, and regularly advances, in the manner as described in the relation transmitted to the college. No person can be supposed to labour under the scurvy, or any symptom of it, unless the gums are affected. Putrefaction of the gums, is the primary and inseparable symptom of the malady in its very first stage. *Orthopnœa*, dropsy, and dysentery, attending the last stage, render the case often incurable. As to scorbutic pains, it is remarkable they afflict equally both day and night, and are not increased by heat, or by lying in bed. The knees, when swelled, are generally covered with large *ecchymoses*. These never come to suppuration on any part of the body, except on the gums, where they often break and ulcerate. The flexor tendons of the *tibia* alone become rigid, *viz.* the tendons of the *semi-nervosus* and *semimembranosus* muscles. Colics afflict in this disease when there is a *diarrhœa* or dysentery, but never otherwise. In many thousand scorbutic patients, I never once saw the true pleurisy, *nephritis*, strangury, nor hæmorrhages from the skin, except where there was a wound; although scorbutic people are subject to hæmorrhages from the lungs, stomach, intestines, &c.; nor did I ever observe any other ulcers than what have been described, in the gums and cheeks, much less any species whatever of a *scabies*. Scorbutic people are never afflicted with epileptic fits, palsies, tremors, &c. Their death is for the most part tranquil, if you except their laborious breathing.

I can aver from experience in above a thousand cases, that this malady is most effectually cured by the fresh
juice

juice of scurvygrafs and cresses, either mixed, or separately taken, to the quantity of three ounces twice or thrice a-day in warm broth. These juices occasion slight flushings of the face, are carminative, and promote urine and perspiration. As those herbs cannot be obtained fresh in many parts of *Hungary*, nor in warm climates, the disease may be effectually cured by three or four ounces of the juice of oranges or citrons, taken twice a-day in a pint of water with sugar, or rather in whey. By juice of citron in whey, twenty patients were lately cured in the hospital of *St Mark* at *Vienna*. As to a preservative medicine against it, I know of none but the essence (I suppose extract) of the *cort. peruv.* taken at bedtime in the quantity of two drams, either by itself, or mixed with other bitters. By this remedy the famous *Count Bonneval* preserved himself and his domestics, many years in *Hungary*, free from the distempers of the country.

1739.

Frederici Hoffmanni medicinae rationalis systematicæ tom 4. part. 5. cap. 1. de scorbuto, ejusque vera indole.

In what he terms a compleat history of this disease, (in an enumeration of the symptoms, classed in *Willis's* manner, according to the different parts of the body affected), among other things he observes, the scorbutic colic is distinguished from all others, by the pain being so shooting, acute, and intolerable. The belly is not, as in other colics, distended with a *flatus*: but the navel is drawn inwards, so as to form a cavity sufficient to hold one's fist. It is very obstinate, yielding neither to medicines nor fomentations; and has often this peculiar to it, that it terminates in a palsy. After a preceding scorbutic *dyspnæa*, the patient is very apt to fall into a dropsy, especially if drastic purgatives have been used. The scorbutic toothach is distinguished from all others, by its suddenly attacking, and as suddenly leaving the patient. Headachs are most troublesome in the evening;

ing; but upon a sweat breaking out, they leave the patient. Some in this disease keep awake for many weeks without being sensibly weakened by it. Scorbutic ulcers appear in the following manner. First, the part is painful; then the *cuticula* separates in like manner as if boiling water had been poured upon the skin; a serous humour oozes forth, and the part becomes extremely painful; but true *pus* is scarce ever observed to flow from the ulcer. At other times, scorbutic ulcers continue deep, and quite dry, without affording either *pus* or *sanies*; and these are very apt to gangrene.

He thinks the best cure for the scurvy is the mineral waters. They are sufficient to effect it, as long experience had convinced him, together with a proper diet and regimen. For this purpose, he recommends the *Carolinæ, Selteranæ, Egranæ, &c.* Where the convenience of mineral waters is wanting, he advises drinking simple, pure, and light water, of any sort; which will often remove the disease. But it is still better if the water partakes of steel principles, such as the *Laubstadt* spring, two miles from *Hall*. It is to be both outwardly and inwardly used. He likewise recommends a milk-diet, especially asses milk. When the scorbutic *diathesis* is complicated with obstructed *viscera*, cachexies, the hypochondriac disease, or the *purpura chronica*; then the cure succeeds better, if the milk be taken mixed with the mineral water. He observes the great detriment of mercury in this distemper; and mentions various antiscorbutics, bitters, emollients, &c. that may be proper.

Siris: *A chain of philosophical reflections and inquiries concerning the virtues of tar-water.* By the Right Rev. Dr Geo. Berkeley Lord Bishop of Cloyne. 1744.

The scurvy may be cured (if the author may judge by what he has experienced) by the sole, regular, constant, and copious use of tar-water.

Theoretisch

1747. *Theoretisch praktische abhandlung des scharboetes, wie sich derselbige vornemlich bey denen kayserlich Ruszischen armeen an verschiedenen orten geauffert und gezeiget hat; &c. :* or, A theoretical and practical treatise of the scurvy, as it has appeared chiefly in the Imperial *Russian* armies, together with a circumstantial description of its causes, means of prevention, and cure. By *Abraham Nitzsch*.

Three different opinions of physicians concerning this disease deserve censure. 1st, Some ascribe many obstinate ailments, especially such as have introduced any great impurity into the blood, *viz.* cutaneous diseases, *purpura chronica*, &c. to the scorbutic taint. 2^{dly}, Many who do not altogether deny the existence of the scurvy, limit or circumscribe it within too narrow bounds. 3^{dly}, Others have described its causes, its different kinds, and cure, in too vague and loose a manner.

The scurvy has been ascribed to the use of salt, dried, and smoked flesh-meats. But this opinion is confuted by daily experience. Others have blamed foggy moist air alone, and damp situations; or a mere want of a sufficient quantity of vegetables: whereas it proceeds from no single cause, but from a concurrence of causes, *viz.* improper, gross, and corrupt aliment; moist air, accompanied either with cold, or with heat; and impure putrid water. These acting in conjunction produce the scurvy, and are sufficient to heighten the evil to an extreme degree of violence.

As those causes operate but slowly in the body, the progress of the malady is very gradual. A change of colour is observed in the face. There is a general lassitude. The thighs and legs feel heavy; and a remarkable weakness is perceived in the knees. At the same time the gums begin to swell and corrupt. The preternatural colour of the face afterwards increases, the legs begin to be painful, the cheeks and bones swell, the gums become monstrously rotten, the body more feeble, and a difficulty of breathing ensues upon using of exercise.

exercise. The knees and joints are also contracted. Finally, the appetite gradually decays, the body becomes constipated, the *abdomen* and *hypochondria* are affected. In some kinds of this disease, several sorts of blue spots appear all at once. And this is *scorbutus lentus seu frigidus*, the slow or cold scurvy. But before we proceed to the hot scurvy, of which there is but one single species, it may be proper to distinguish the different kinds of cold scurvies.

The first is what occasions large, black, and blue *vibices*, or spots, on the legs and joints; sometimes on the breast and back, not unusually on one or both eyelids, and on the white of the eye; which appears swelled, and of a deep red colour; upon which ensues an *ophthalmia*, and afterwards the *chemosis lenta*. The gums are greatly swelled, discoloured, and very lax or spongy; and when pressed, discharge either a yellow ill-scented blood, or matter. The parotid glands are also usually much enlarged. This species, proceeding from a remarkable resolution of the red globules of the blood; is denominated *scorbutus lividus vel livescens*, a livid scurvy; being the only species that is accompanied with partly dark, reddish, and livid streaks, upon the skin. The patient is feverish, and the pains are very violent. It occurred mostly at *Wiburg*, *ann.* 1732; and again at *Petersburg*, *ann.* 1733.

In the second species, the red globules of the blood are not so much resolved; it proceeding chiefly from a viscidness of the lymphatic or serous parts of the blood. The spots appear of a deep red, turning afterwards to a darkish yellow; being very small, so as to resemble small peas, flea-bites, or *petechiæ*; and are discovered no where else but on the shins and ankles, attended with a soreness in the skin. Sometimes reddish blue *vibices* appear upon the knee, and in the ham; the pain and swelling there, as also the quickness of the pulse, being always increased, in proportion to the redness of these *sugillationes*.

The gums are not so lax as in the former species: the upper part of them, however, is more excoriated. On the inside of the cheeks are observed swellings, sometimes hard, knotty, and wart-like, at other times fungous; and sometimes a uniform fungous substance extends itself even to the back part of the mouth. This species, from the form of the spots, is denominated a *lenticular* or *peteckial scurvy*. The patient spits more, and the breath is more foetid, than in any other species. Sometimes the temporal muscle is swelled and hardened under the zigomatic process; but the parotid glands never are. It shewed itself, *ann.* 1732, at *Wiburg*, only here and there; but afflicted much greater numbers, *ann.* 1737, in the intrenchments at *Ust-Samara*.

A third species of this disease proceeds from a corruption of the fat or oily particles of the blood. There being no viscosity either of its serous or grumous parts, there are consequently no spots. On the contrary, an universal pale swelling covers the body; which becomes of a yellowish colour, when these oily particles turn rancid. When the fat assumes a hardness like tallow, the thighs and arms are prodigiously swelled and indurated; and true *tophi* appear on the hands and shins. Now, in this species the serous parts of the blood become much more easily and quickly vapid than in the others, and the saline particles daily more and more acrimonious. Hence the cheeks are more swelled, the knees more violently contracted, the teeth looser, and the gums much more lax and rotten. Sometimes a fungous flesh rises at the angle of the lower jaw, and the jaws are locked either with or without an induration of the parotid gland, *crotophite* or *masseter* muscles. When this inert vapid *serum* is accumulated in the *tunica cellulosa*, an *anasarca* is induced; when within the substance of the lungs, an asthma, upon which a true *hydrops pectoris* ensues; when in the lower belly, an *ascites per infiltrationem*; and when in the glands of the guts, a *diarrhœa*. When this vapid

serum,

serum, by addition of oily and saline particles, has acquired an acrimony, it occasions the most violent and gnawing pains in different parts of the body. Wherever it corrupts, the pains become there altogether intolerable, chiefly upon those parts where the ribs are articulated with the *sternum*; part of the bones of which may be taken out quite carious. It also produces a spasmodic suffocative asthma, a colliquative painful *diarrhœa*, and afterwards a gangrene of the cheeks, or an incurable *ascites*. This species is of longer duration than any other, continuing often the whole summer, until late in autumn. And as it is accompanied with no spots, it may be denominated the *pale scurvy*; but when the fat is thick and viscous, the *mucous pale scurvy*; when it is become rancid, the *rancescent scurvy*; or when hard, and tallow-like, the *tophaceous scurvy*; lastly, when the juices are very sharp, the *muriatic scurvy*. In this species the author saw great numbers of patients before *Asoph*, and in the general field-hospital at *St Anne*; as also in the *Neister* campaign. He observed the tophaceous first in *Finland*, at *Borgo*, ann. 1742; and the muriatic, where the cartilages of the ribs were really separated from the *sternum* (g), as was plainly to be seen and felt, at the field-hospital at *Abo*, ann. 1743.

These are the chief kinds of the slow scurvy, which occurred in the *Russian* armies, and fell under the author's observation. There is indeed yet another species of it, proceeding from a total resolution of the grumous parts of the blood; which occasions an extraordinary weakness and redness of the body, tumified pendulous cheeks, a deep cachexy, extremely stinking, fungous, putrid, and purulent gums, contracted knees, &c. But this he never observed, except in the intrenchments of *Ust-Samara*.

Thus much of the cold scurvy. There remains the

(g) Cases similar to those at *Paris*. Vid. dissections, part 2. cap. 7.

most opposite branch of this disease, *viz.* the *hot* and *painful scurvy*. It is distinguished from the former, *1st*, By there being no repletion or swelling of the body; on the contrary, there is rather a decay or wasting (*b*): *2dly*, The gums are neither so fungous nor foetid; they are rather much swelled, very hot, and so painful, that the gentlest touch gives agony. *3dly*, The pains are not so fixed as in the cold scurvy. The patient makes continual complaints, sighing and bemoaning his condition; and has a constant, though irregular, fever. The pains fly from one member to another; sometimes from the back to the whole or half of the head, teeth, and neck; where, after occasioning the most exquisite torture, they again instantly attack the outside or inside of the *thorax*, occasioning extreme oppression, stitches, &c.: afterwards, seating themselves in the *abdomen*, they produce colics, nephritic pains (*i*), and stoppage of urine, and on the extremities all sorts of convulsive contractions. *4thly*, The knees are extremely rigid and contracted: but, unless it has been occasioned by some outward accident, they are not so much swelled or inflamed as in the cold scurvy. *5thly*, No spots are seen. *6thly*, The principal difference lies in the urine: for in the livid and petechial scurvies, though the urine is of a deep red, and undergoes little alteration by standing; yet this hot species is distinguished from them, by the fever which ac-

(*b*) Vid. part 2. p. 339.

(*i*) Vid. *Sinop.* part 3. p. 413. By the account of northern writers, it would seem, that venereal diseases do not so readily yield to mercurial medicines as they do in warmer climates. *Sinopeus* tells us, that he found great difficulty to cure even a common *gonorrhœa* at *Cronstadt*. And as for the pox, except it was very recent, the taint could not be subdued by repeated salivations: for the disease generally broke out again, always in the spring, together with the scurvy; the latter seeming constantly to awake any sparks of the venereal poison lurking in the body. During a scorbutic constitution, those who, for venereal complaints, underwent a slight salivation, fell into a dreadful scurvy; which being removed, left a worse *lues* behind it.

companies

companies it; and the thick sandy sediment in the urine, which has a thin, white, greasy film a-top. This hot scurvy he has remarked here and there; yet he no where saw more patients labouring under it than at *Wiburg*.

It may not be amiss to describe the various causes which produced this calamity, in the order in which they occurred.

1st, As to the siege of *Asoph*: This place was attacked in the spring *ann. 1736*, in very piercing cold weather, accompanied with frequent rain, sleet, and sometimes with snow. And as there were no woods in the neighbourhood, the troops suffered extremely, during this rigorous season, for want of firing. Nor did the regiments fare better who were ordered to join us; as most of them were obliged to begin a long journey by land, upon a very short warning; or were transported in boats down the *Don*, together with the artillery, from the garrison of *Nova Pawloffsky*, and the adjacent places. Now, as this siege, by various accidents, was protracted three months, the inconveniencies and hardships which the troops suffered, were extremely great. 1st, The weather became excessive hot; and was quite un-supportable during sun-shine, and on serene days. 2^{dly}, We had a great deal of moist rainy weather; which greatly incommoded our army, which was incamped on slippery and hilly ground; as also the sick in their tents, who were ill attended; their tents being also ill contrived. 3^{dly}, Sickness was occasioned by the too frequent eating of fish ill dressed, with which the plentiful river *Don* abounds. 4^{thly}, The bread was ill baked, for want of fewel. 5^{thly}, The water was very impure, being taken up from the fordable parts of the *Don*, which became every day worse and worse. To which may be added, the preceding camp-disorders, *viz. diarrhæas*, and obstinate quartans; besides the passions of the mind raging in the breasts of the soldiers, *viz. disappointments*,
revenge,

revenge, anger, discontent, &c. and the great fatigues they underwent.

As to what regards the fortress of *St Anne*; though the ground about it rises pretty high, yet it lies so low with respect to *Great* and *Small Russia*, that it is from thence annually overflowed; generally in the month of *April*, for thirty versts around, upon the breaking loose of the ice and snow. The country about it appears like a great sea; and many parts within the fortresses are sunk several feet below water. This inundation of the *Don* brings along with it an incredible number of excellent and very fat fish; which were sold excessively cheap, and eat in immoderate quantities, either fresh or dried. During the inundation, the air is very raw, cold, and windy. At the time of its drying up, the days are excessively hot; and the sun is scorching, when the weather is fair; but the nights, on the contrary, are intolerably cold, with a foggy moist air. As the morasses dry up, and the remaining fish (especially crayfish, of which there is an astonishing quantity left behind) begin to putrify, the air becomes more stinking; and so thick, that it is several hours every morning, before the sun has power to dissipate the noxious vapour. Upon the retiring of the flood, the ground shews a sandy bottom, and is formed into little islands and banks of sand, surrounded with fords filled with stagnating water. What was drank, was often not taken where the stream was quick and deep, but in such fords where it was muddy and greasy. The fish remaining behind, were eat in immoderate quantities ill dressed. The barracks were built on morasses, damp ground, and too low. Lastly, The soldiers being the only inhabitants of the garrison, were obliged to stand every day up to their middle in water, in order to unload the necessary wood; which is always sent them for fuel and building from the *Ukraine*.

The principal reason why, of those regiments who marched to *Oczakow*, such a considerable number were
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attacked by the scurvy, and brought into the hospital at *Cobilack*, was, the excessive fatigues they underwent through the whole winter, partly in cutting open the ice of the *Neiper*, to prevent the incursions of the *Tartars*; and partly in performing other hard and severe military duties, either in stormy sleety weather, or during excessive frost and cold, without having proper conveniences, lodgings, or diet. Even those who underwent no fatigue, being afflicted with ailments of different sorts, for want of sufficient attendance, rest, and quiet, in the army, became also scorbutic.

As to what regards the great number of scorbutic patients, which occurred not only during the march of the army from *Oczakow*, but also during the *Neister* campaign; the author treats only of the latter, as having been there in person; and because, according to his best information, the occasions and causes of the malady in both differed very little, or rather not at all.

The most part of the recruits required to complete the army, joined them seldom sooner than when either the army was ready to march, or was actually in motion. And though they were generally young raw fellows, excessively fatigued after a long and tedious journey; yet it was not possible to grant them any rest or necessary refreshment. They were directly incorporated into the respective regiments; and entered at once upon a new way of life, *viz.* of constant disquiet, military hardships and severities, and of great fatigue. The marches were begun early in the morning, often during thick fogs and dews, heavy rains, or severe cold. Towards the middle of the day, they were oppressed either with intolerable scorching heat, and clouds of dust, or with much rain. The march was protracted for the most part till noon, and often beyond that time, according as water, wood, and forage, were to be met with in those desert places. Thus the poor soldier, after a fatiguing journey, either quite enfeebled by the excessive heat of
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the sun, or drenched in rain, arrived at last at the camp. But often, even here, no rest could be permitted him. He was obliged, according as it was his tour, to go upon the piquets, *tabunen*, or the centinel's duty. Another great hardship was the want of good and clean water upon the roads. Overcome by the excessive heat, some threw themselves naked into every dirty muddy pond they met; while others endeavoured to quench their violent drought, occasioned by the dust and sun, by greedily drinking up every drop of filthy stagnating water they saw upon the ground. This bred many diseases, especially continual inflammatory fevers, &c. Plethoric habits were attacked with apoplectic fits; which if not removed by immediate blood-letting, they quickly expired. Their blood was so inflamed, that it came out as thick as pitch. But the hardships which the sick underwent, were still greater. They were by most regiments carried in open carts, exposed to all the inclemencies of the climate and weather, *viz.* to rain, dust, and wind, heat and cold. In passing the defiles, being generally the last, it was always several hours before they arrived in camp after their regiments; notwithstanding on the marching-days they set out early in the morning, long before the rest of the army; and after having been quite soaked in rain in their carts, were then taken out, and laid upon their bed stretched out under moist canvas, upon the cold wet ground. Nor, in such afflicting circumstances for the sick, was it a small addition to their misery, that, in this desolate and uninhabited country, proper food and drink could not be procured, in order to restore them to health and strength. Hence it is not to be wondered at, that from such causes, as also by reason of the great preceding sickness and fevers in the camp, (which, for want of conveniences and proper treatment, were brought to no perfect crisis), the scurvy raged with such uncommon destruction.

It is, however, remarkable, that this evil was greatly prevented in the *Chocim* campaign, *ann.* 1739, by send-
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ing the recruits much earlier; so that they had sufficient time to be refreshed after their journey, and were accustomed a little to the military life and diet before they marched: as also by every regiment's being provided with four covered waggons for their sick; by which they were at all times sheltered from rain, dust, wind, and weather. The happy effect of those excellent regulations was, that in a whole division, consisting of ten or twelve regiments, we had scarcely as many scorbutic cases as occurred in the former campaign in one regiment only; and then again an incredible less number died. For his method of cure, see his account of the scurvy at *Wiburg*, p. 407.

A voyage round the world, in the years 1740, 41, 42, 43, 44, by George Anson, Esq; now Lord Anson, commander in chief of a Squadron of his Majesty's ships, sent upon an expedition to the South seas. Compiled from his papers and materials, by Richard Walter, M. A. &c. 1748.

Soon after our passing straits *Le Maire*, the scurvy began to make its appearance amongst us: and our long continuance at sea, the fatigue we underwent, and the various disappointments we met with, had occasioned its spreading to such a degree, that, at the latter end of *April*, there were but few on board who were not in some degree afflicted with it; and in that month no less than forty-three died of it on board the *Centurion*. But tho' we thought, that the distemper had then risen to an extraordinary height; and were willing to hope, that as we advanced to the northward, its malignity would abate: yet we found, on the contrary, that, in the month of *May*, we lost near double that number. And as we did not get to land till the middle of *June*, the mortality went on increasing; so that, after the loss of above 200 men, we could not at last muster more than six foremast men in a watch, capable of duty.

This disease, so frequently attending all long voyages,

and so particularly destructive to us, is surely the most singular and unaccountable of any that affects the human body. Its symptoms are unconstant and innumerable; and its progress and effects extremely irregular: for scarcely any two persons have the same complaints; and where there hath been found some conformity in the symptoms, the order of their appearance has been totally different. However, though it frequently puts on the form of many other diseases, and is therefore not to be described by any exclusive and infallible criterions; yet there are some symptoms which are more general than the rest, and occurring the oftentest, deserve a more particular enumeration. These common appearances are, large discoloured spots dispersed over the whole surface of the body; swelled legs; putrid gums; and, above all, an extraordinary lassitude of the whole body, especially after any exercise, however inconsiderable: and this lassitude at last degenerates into a proneness to swoon, on the least exertion of strength, or even on the least motion. This disease is likewise usually attended with a strange dejection of spirits; and with shiverings, tremblings, and a disposition to be seized with the most dreadful terrors, on the slightest accident. Indeed it was most remarkable, in all our reiterated experience of this malady, that whatever discouraged our people, or at any time damped their hopes, never failed to add new vigour to the distemper: for it usually killed those who were in the last stages of it, and confined those to their hammocks who were before capable of some kind of duty. So that it seemed, as if alacrity of mind, and sanguine thoughts, were no contemptible preservatives from its fatal malignity.

But it is not easy to complete the long roll of the various concomitants of this disease. For it often produced putrid fevers, pleurisies, the jaundice, and violent rheumatic pains. And sometimes it occasioned an obstinate constiveness; which was generally attended with a difficulty
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of breathing; and this was esteemed the most deadly of all the scorbutic symptoms. At other times the whole body, but more especially the legs, were subject to ulcers of the worst kind; attended with rotten bones, and such a luxuriance of fungous flesh as yielded to no remedy. But a most extraordinary circumstance, and what would be scarcely credible upon any single evidence, is, that the scars of wounds which had been for many years healed, were forced open again by this virulent distemper. Of this there was a remarkable instance in one of the invalids on board the *Centurion*, who had been wounded above fifty years before at the battle of the *Boyne*: for though he was cured soon after, and had continued well for a great number of years past; yet, on his being attacked by the scurvy, his wounds, in the progress of his disease, broke out afresh, and appeared as if they had never been healed. Nay, what is still more astonishing, the callous of a broken bone, which had been compleatly formed for a long time, was found to be hereby dissolved; and the fracture seemed as if it had never been consolidated. Indeed, the effects of this disease were in almost every instance wonderful. For many of our people, though confined to their hammocks, appeared to have no inconsiderable share of health; for they eat and drank heartily, were chearful, and talked with much seeming vigour, and with a loud strong tone of voice; and yet on their being the least moved, tho' it was only from one part of the ship to the other, and that in their hammocks, they have immediately expired. And others, who have confided in their seeming strength, and have resolved to get out of their hammocks, have died before they could well reach the deck. And it was no uncommon thing for those who could do some kind of duty, and walk the deck, to drop down dead in an instant, on any endeavours to act with their utmost vigour; many of our people having perished in this manner, during the course of this voyage.

Upon arriving at the island of *Juan Fernandes*, 167 sick persons were put on shore, besides at least a dozen who died in the boats, on their being exposed to the fresh air. The extreme weakness of the sick may be collected from the numbers who died after they got on shore: for it had generally been found, that the land, and the refreshments it produces, very soon recover most stages of the sea-scurvy; yet it was near twenty days after their landing, before the mortality was tolerably ceased: and for the first ten or twelve days, they buried rarely less than six each day; and many of those who survived, recovered by very slow and insensible degrees. Indeed those who were well enough, at their first getting on shore, to creep out of their tents, and crawl about, were soon relieved, and recovered their health and strength in a very short time; but in the rest, the disease seemed to have acquired a degree of inveteracy altogether without example.

It was very remarkable what happened to the *Gloucester*, which, like the other ships in that squadron, had suffered the most unparalleled hardships, and buried three fourths of her crew in this disease; that, upon landing the remainder of her sick, less than eighty in number, very few of them died. Whether it was, (as the ingenious author observes), that the farthest advanced in the distemper were already dead, or the greens and fresh provisions sent on board them when plying off that island, had prepared those who remained for a speedy recovery; their sick, however, in general, got much sooner well than the *Centurion's* crew.

The havock which this dreadful calamity made in those ships, was truly surprising. The *Centurion*, from her leaving *England*, when at this island, had buried 292 men, and had but 214 remaining of her complement. The *Gloucester*, out of a smaller complement, buried the same number, and had only 82 alive. This dreadful mortality had fallen severer on the invalids

lids and marines than on the failors: for on board the *Centurion*, out of fifty invalids, and seventy-nine marines, there remained only four invalids, including officers, and eleven marines; and on board the *Gloucester*, every invalid died, and only two marines escaped out of forty-eight.

In less, however, than seven weeks after leaving the coast of *Mexico*, having continued in perfect health for a considerable time before, this fatal disease broke out again amongst them. Upon which occasion, the ingenious author makes the following remarks.

Some amongst us were willing to believe, that in this warm climate the violence of the disease, and its fatality, might be in some degree mitigated. But the ravage of the distemper at that time convinced them of the falsity of this speculation; as it likewise exploded other opinions about the cause and nature of this disease. For it has been generally presumed, that plenty of water, and of fresh provisions, are effectual preventives of this malady. But it happened in the present case, we had a considerable stock of fresh provisions on board, being the hogs and fowls taken at *Paita*. We besides, almost daily, caught great abundance of bonito's, dolphins, and albicores: and the unsettled season having proved extremely rainy, supplied us with plenty of water; so that each man had five pints a-day during the passage. But notwithstanding this plenty of water, and fresh provisions distributed among the sick, and the whole crew often fed upon fish; yet neither were the sick hereby relieved, nor the progress and advancement of the disease retarded. It has likewise been believed by many, that keeping the ship clean and airy betwixt decks, might prevent, or at least mitigate the scurvy: yet we observed, during the latter part of our run, that, though we kept all our ports open, and took uncommon pains in sweetening and cleansing the ships; yet neither the progress,

gress, nor the virulence of the disease were thereby sensibly abated. The surgeon at this time having declared, that all his measures were totally ineffectual for the relief of his patients, it was resolved to try the effects of *Ward's* drop and pill; and one, or both of them, at different times, were given to persons in every stage of the distemper. Out of the numbers who took them, one, soon after swallowing the pill, was seized with a violent bleeding at the nose. He was before given over by the surgeon, and lay almost at the point of death; but he immediately found himself much better, and continued to recover, though slowly, till we arrived on shore near a fortnight after. A few others were relieved for some days. But the disease returned again with as much virulence as ever; though neither did these, nor the rest who received no benefit, appear to be reduced to a worse condition than they would have been if they had taken nothing. The most remarkable property of these medicines in almost every one that took them, was, that they operated in proportion to the vigour of the patient. So that those who were within two or three days of dying, were scarcely affected; and as the patient was differently advanced in the disease, the operation was either a gentle perspiration, an easy vomit, or a moderate purge. But if they were taken by one in full strength, they then produced all the before mentioned effects with considerable violence; which sometimes continued for six or eight hours together with little intermission. Upon their arrival at *Tinian*, they soon began to feel the salutary influence of the land: for though they had buried in two days before twenty-one men, yet they did not lose above ten more from the day after they were landed; and reaped so much benefit from the fruits of the island, particularly those of the acid kind, that in a week's time there were but few of them who were not so far recovered as to be able to move about without help.

A voyage to Hudson's-bay, by the Dobbs galley, and California, in the years 1746 and 1747, for discovering a north-west passage. By Henry Ellis. 1748.

The bringing two casks of brandy from *York-fort* for our *Christmas* cheer, was attended with fatal consequences. The people had been healthy enough before this season of mirth came; but indulging themselves too freely, they were soon invaded by the scurvy, the constant attendant on the use of spirituous liquors. It is a melancholy, but withal a necessary task, to describe the progress of this foul and fatal distemper. Our men, when first seized with it, began to droop, to grow heavy, listless, and at length indolent, to the last degree: a tightness in the chest, pains in the breast, and a great difficulty in breathing followed; then ensued livid spots upon the thighs, swelled legs, contraction of the limbs, putrid gums, teeth loose, a coagulation of blood upon and near the back-bone, with countenances bloated and fallow; these symptoms continually increasing, till at length death carried them off, either by a flux or a dropsy. Those medicines which in other countries are generally used with good effects, proved entirely ineffectual here. For unctions and fomentations, when applied to contracted limbs, afforded no relief: fresh provisions, indeed, when we could get them, did somewhat. But the only powerful and prevailing medicine, was tar-water; and the steady use of this saved many, even after the disease was far advanced, when all other medicines lost their efficacy, and were tried to no purpose. As far as we could observe, this salutary drink operated no other way than by urine (*k*).

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(*k*) Upon this relation, I must beg leave to observe, that though the immoderate use of spirits had certainly pernicious effects; yet the severity of the winter, their being denied proper refreshments from the *English* forts, and particularly, in such circumstances, a want of greens and herbage, which do not seem to have appeared on the ground

1749.

An historical account of a new method for extracting the foul air out of ships, &c. with the description and draught of the machines by which it is performed; by Samuel Sutton, the inventor. To which are annexed, Two relations given thereof to the Royal society, by Dr Mead; and Mr Watson; and, A discourse on the scurvy, by Dr Mead. Ejusdem monit. et præcept. medic. cap. 16. de scorbuto.

The learned author very justly describes the most essential symptoms of the scurvy. He imagines the air even more than any other agent concerned in bringing on this calamity. How the sea-air acquires such noxious qualities, he accounts for in the following manner. In the first place, moisture weakens its spring; next a combination of foul particles, such as are contained in the breath of many persons crowded together, and some perhaps diseased; then the filthiness of water stagnating in the bottom of the ship; lastly, salts imbibed from the sea, some of which may probably have proceeded from putrified animals in that element, may insinuate themselves into the blood, and, in the nature of a ferment, corrupt its whole mass. Other causes, as bad diet, &c. concur to breed the disease. For the prevention of it, he recommends the use of Mr *Lewendes's* salt

ground till towards the latter end of *March*; p. 204, were what principally occasioned the disease. As he very justly accounts for its return upon their passage home, p. 281: where he says, "The uncomfortable weather we had, made so chiefly by the thick and noisome fogs, proved the cause that many of our people began now to relapse into their old distemper, the scurvy." As to the good effects ascribed to the tar-water while at *Port-Nelson*; it were to be wished, both in this and many other relations of the effects of medicines in this disease, that we had always been informed what other regimen the patients underwent, particularly as to their diet and lodgings. The mortality from this disease seems to have been increased in the latter end of *January*; and in the latter end of *March* several were in a bad way. Some likewise died of it on their passage home; which could not be for want of this medicine on board a ship, which has been often tried at sea.

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made from brine, as preferable for salting provisions, both flesh and fish, to that made from sea-water, even to the bay-salt; would have stock-fish used at sea, which is dried without any salt, instead of salt fish; and thinks, that the *Dutch gort*, which (as he had been informed) is a kind of barley ground, is not so hot and drying as oat-meal. Wine-vinegar is likewise a proper preservative. He observes, that the disease is cured by vegetables, and land-air; and that hotter and colder vegetables, when mixed, qualify each other, especially as the acid fruits in Lord *Anson's* voyage were found of most benefit. Milk of all sorts, and its whey, when it can be had, are proper antiscorbutic food and physic. But as the design of this discourse is principally to demonstrate the usefulness of *Sutton's* machine, he particularly insists upon the advantage that might reasonably be expected from it. The book indeed contains several indisputable testimonies of the usefulness of these pipes; the operation of which is accounted for by the Doctor and Mr *Watson*.

De tabe glandulari, sive de usu aquæ marinæ in morbis glandularum, dissertatio. Auctore Ricardo Russel, M. D. 1750.

The use of sea-water would be very beneficial to sailors in bilious colics, both to prevent the disease, and its return after the cure. This latter is to be effected by a *semicupium*, and purging salts, after the inflammation has been removed by plentiful bleeding. In his letter to Dr *Lee*, he observes, that, after taking into serious consideration the case of that scorbutic putrefaction which afflicts seamen, he finds, that it is falsely ascribed to their salt provisions. Salt not only preserves meat from corruption, but mariners also from that corrupt state. This is confirmed, by remarking the strength and good state of health which poor country-people enjoy whilst living upon the same food as seamen. Thus there are many in every country who have lived, perhaps

for thirty years, altogether upon salt beef, bacon, and coarse puddings, unless upon a high holiday, when they are sometimes regaled with a bit of fresh meat; and yet continue perfectly healthy and strong. So that the difference between those people and seamen lies only in this, that the latter have not the benefit of so much exercise, and live in a moist air, by which the tone of their fibres is relaxed, and perspiration stopt.

1750. *An essay on fevers, &c. By Dr John Huxham. Appendix, A method for preserving the health of seamen in long cruises and voyages.*

He thinks the scurvy at sea owing to bad provisions, bad water, bad beer, &c. The pernicious effects of which will be considerably augmented by living in a moist, salt atmosphere, and breathing the foul air betwixt decks. The most effectual way of correcting this alcalescent acrimony in the blood, is by vegetable and mineral acids: and for that purpose he particularly recommends cyder; of which each sailor should have at least a pint a-day.

1752. *A dissertation on quick-lime and lime-water. By Dr Ch. Alston.*

The Doctor informs us, that he published this paper chiefly for the use of mariners. He attributes the good effects of lime-water in putrid scurvies, and some other diseases, not so much to an antiseptic virtue, (which it is possessed of), as to its penetrating, detergent, and diuretic qualities. He has discovered, that lime prevents the corruption of water, or insects breeding in it; and thinks this water will be useful in curing the diseases to which sea-faring people are most subject. One pound of fresh well-burnt quick-lime of any kind, is enough to be put in a hoghead of water; and this may be used, not only for common drink by the diseased, or for prevention by the healthy; but also by boiling, and exposing it to the air for a short time, it will become, after long keeping, sweet

sweet and wholesome water. When lime-water, by standing exposed for some time to the air, has thrown up all its crusts, none of the qualities of lime-water remain in it. From the notable quality he found in quick-lime to prevent water from corrupting, he often thought, that some of it put in the ship's well would effectually prevent the corruption of the water there, and consequently the putrid steams or foul air arising from thence. All these experiments are safe, easy, and attended with no expence.

An essay on the sea-scurvy: wherein is proposed an easy method of curing that distemper at sea, and of preserving water sweet for any cruise or voyage. By Dr Anthony Addington. 1753.

The description of the disease is borrowed from *Cockburn, Boerhaave, Hoffman, Eugalenus, Lord Anson's voyage, &c.* The cure proposed at sea, is to be begun, if there be any marks of fulness, by blood-letting. This is recommended upon the authority of *Hoffman, Boerhaave, Sennertus, and Brucæus, as also Eugalenus.* In order to lessen the quantity of redundant blood still more, the patient is afterwards to be put under a course of gentle and daily purgation, with sea-water. *Boerhaave,* without any restriction to the habit of the patient, gives us the greatest expectations from a moderate and protracted course of purging in the scurvy; and *Hoffman* speaks to the same purpose. But where there are marks of virulence in the scurvy, it will be lost labour to rely on simple sea-water, unassisted with any other antiputrid medicine. So if, in conjunction with that water, we make a prudent use of the spirit of sea-salt, we shall but seldom be disappointed in our hopes of a cure. This is that safe and effectual corrector, which will counteract the putrifying quality of rock and bay salt, when they have been taken in such large quantities as to occasion the scurvy. Twenty drops of this spirit taken every day,

will probably succeed with most patients. Five of them are to be given in the sea-water every morning, and the remainder at any other times in fresh water: to a pint of which, ten drops will impart an agreeable acidity. When the vessels have been pretty well unloaded by the purgation with salt-water, and the bad symptoms begin to decline, the patient (with some exceptions) is to be bathed every morning in the sea just before he drinks his water. Sea-water is also to be used externally, where there are ulcers on the gums and legs, or rotten bones. To give the greatest sanction that can be given to the outward application of sea-water in scorbutic ulcers, it is advised for them by *Hippocrates*. In scorbutic fluxes, mortifications, and hæmorrhages, the salt water is to be omitted. The most probable way to remove the last symptom, is, to bleed the patient as often and as much as his strength and age will permit; to open the belly, if costive, by glysters; and to oblige him to live entirely on the unfermented farines, and to drink freely of water softened with *gum. Arabic.* and strongly acidulated with *sp. salis.* About an ounce and a half of spirit of salt to a tun of water, will preserve it from corrupting.

A P P E N D I X.

IT has been no easy matter to obtain a knowledge of the many writings on this distemper. There have been collections made from time to time, of the several authors on the plague, venereal disease, &c.; but no such have been compiled of writers on the scurvy. *Sennertus*, ann. 1624, when he wrote his own treatise, reprinted the writings of *Solomon Albertus* and *Martini*, together with *Ronssseus*, and the authors which he had published ann. 1583, viz. *Echthius*, *Wierus*, and *Langius*; and this book, containing those seven authors, is the only collection ever published of writers on the scurvy. There was here as little assistance to be obtained from medical *bibliothecæ*. *Lipenius*, in his *Bibliotheca realis medica*, published ann. 1679, reckons up twenty-nine writings on this subject, of which eight are academical discourses or disputations. *Mercklin*, in his *Cynosura medica*, published in the year 1686, enumerates twenty-four authors on the scurvy. Of these, one, viz. *Henricus a Bra*, is classed among them (though improperly) upon account of a letter written to *Forestus*, upon a very different subject (a). Another, viz. *Albertus*, he has by mistake inserted twice in his list; and has given a place in it to *Jos. Stubendorfsius* an editor of *Eugalenus*, *Simon Paulli*, *Joh. Langius*, *Arnold. Weickardus*, and *Ludov. Schmid*; which three last I have taken notice of in the *Bibliotheca*, though perhaps they are not deserving of it. He has besides included in it three academical disputations. The indefatigable Dr *Haller* published ann. 1751, in his notes illustrating *Boerhaave's Methodus studii medici*, the titles of almost all medical

(a) Vid. *Foresti observ. medicinal. lib. 20. obs. 12.*

writings now extant, no less than 30,000 volumes. But it were to be wished, that so good a judge had distinguished such books as, not being able to maintain their character, are now out of print, or occasional pamphlets, and some trifling academical orations and disputations, from writings of greater value.

The following list contains the titles of such writings on the scurvy, as have been omitted in the foregoing sheets, but are mentioned in those collections; and comprehends all that, after the most diligent inquiry, have come to my knowledge; except a few academical disputations.

J. Roetenbeck und Casp. Horns beschreibung des scharboks. Nurnberg. 1633.

Christoph. Tinctorius de scorbuto Prussiae jam frequenti. Regiom. 1639.

J. van Beverwyck van de Blaauw schuyt. Dordrac 1642.

Henrici Botteri (b) tractatus de scorbuto. Lubec 1646.

J. Schmidts von der pest Frantzosen und scharbock (c). Augspurg. 1667.

Phil. Hæchstetteri (d) observationes medicinales raræ. Lip. 1674.

Hen. Cellarius bericht von scharbock. Halberstatt 1675.

Jon. Zipfel vom scharbock griesstein und podagra. Dresd. 1678.

Maitland on the scurvy.

Melchioris Friccii dissertatio de colica scorbutica. Ulm 1696.

(b) Professor at *Cologne*. I have not seen his treatise; nor did *Haller*. I never found it so much as quoted by any author, though it underwent two editions.

(c) I have seen the book; it contains nothing remarkable.

(d) A physician at *Augsburg*. *Decad. 7. cas. 10.* contains some good observations on the scurvy.

J. Hummel

J. Hummel de arthritide tam tartarea quàm scorbutica (e).
Buding 1738.

Pierre Briscow traité du scorbut (f). Paris 1743.

Cadet dissertation sur le scorbut, avec des observations (f).
Paris 1749.

Academical performances.

Jacob. Albini disputatio de scorbuto (g). Basil. 1620.

Abrahami Dreyeri disputatio de scorbuto (g). Basil. 1622.

Amb. Rhodii disputatio de scorbuto. Haffn. 1635.

Jac. Haberstro disp. inaug. de scorbuto. Jen. 1644.

Herm. Conringii disp. Resp. Behrens. Helmsf. 1659.

Geo. Franci disp. Resp. Wyck. Heidelb. 1670.

And. Birch Angli disp. inaug. de scorbuto. Lugd. Bat.
1674.

Olai Borrichii disp. Resp. Job. Melch. Sulzero. Haffn.
1675.

Caroli Patini (h) *oratio de scorbuto*. Patav. 1679.

Sam. Koeleser de Kereseer de scorbuto Mediterraneo. Ci-
binii 1707.

G. Thiesen de morbo marino. Lugd. Bat. 1727.

Michaelis Alberti (i) *disp. de scorbuto Daniæ non endemio*.
Hall. 1731.

*Christoph. Mart. Burchard disp. de scorbuto maris Bal-
thici accolis non endemio*. Rostoch. 1735.

Sim. Pauli Hilscher (k) *programma de scelotyrbe memora-
bili casu illustrata*. Jen. 1747.

Mich. Law dissert. medic. inaug. de scorbuto. Edin.
1748.

(e) An indifferent character of it is given by *Haller*.

(f) These two *French* authors are now out of print, as would
seem at *Paris*. I imagine the latter to have been an academical
performance.

(g) Both are preserved in a collection of academical disputa-
tions, published by the bookseller *Genathius*.

(h) Professor at *Padua*; more celebrated for his other writings
than this.

(i) Present professor of medicine at *Hall* in *Saxony*.

(k) Present professor at *Jena*.

A CHRONOLOGICAL INDEX

of medical authors who have written particular books on the scurvy; as also the principal systematic, and other medical writers, whose sentiments are delivered in this treatise.

1534. *Euritius Cordus*, a celebrated Botanist. He died ann. 1538.
1539. *Jo. Agricola (Ammon.)*, Professor of Medicine, &c. at Ingolstadt.
1541. *Jo. Echthius*, a physician at Cologne, by birth a Dutchman. He died ann. 1554.
1560. *Jo. Langius*, chief physician to the Elector Palatine.
1564. *Balduin. Ronssseus*, ordinary physician to the city of Goude in Holland.
1567. *Jo. Wierus*, chief physician to the Duke of Cleves and Juliers.
Adrian. Junius, an eminent physician and historian. He died ann. 1575.
1581. *Rembert. Dodonæus*, chief physician to the Emperor of Germany.
1589. *Hen. Bruceus*, Professor at Rostock.
Balthas. Brunerus, chief physician to the Prince of Anhalt.
1593. *Solomon Albertus*, Professor of Medicine at Wittenburg.
1595. *Petrus Forestus*, physician at Alcmaer, Professor at Leyden, &c. (a).

1600.

(a) Besides the above authors, it is taken notice of by several other medical writers in the sixteenth century, viz. *Cornelius Gemma (Cosmocritic. lib. 2. cap. 2.)*, *Petrus Pena (adversar. stirpium, p. 121. & 122.)*, *Schenckius (observat. medicinal.)*, *Carrichterius (prax. Germanic. lib. 1. cap. 41.)*, *Mithobius de peste*, *Ladernæmon de thermis*,
Peucerus

1600. *Hieronymus Reusnerus*, physician to the city of Norlingen.
1604. *Severinus Eugalenus*, a physician of Dockum in Friesland.
1608. *Felix Platerus*, Professor of Medicine at Basil in Switzerland.
1609. *Gregorius Horstius*, chief physician to the Landgrave of Hesse, Professor at Giessen.
- Mat. Martini*, physician at Eisleben.
1624. *Daniel Sennertus*, Professor of Medicine at Wittenburg, and chief physician to the Elector of Saxony.
1626. *Arnold. Weickardus*, a physician at Francfort.
1627. *Ludov. Schmid*, chief physician to the Marquis of Baden, &c.
1627. *Gul. Fabric. Hildanus*, physician and surgeon to the Marquis of Baden, &c.
1633. *Jo. Hartmannus*, Professor at Marpurg.
1640. *Iazar. Riverius*, the celebrated Montpelier Professor.
1645. The faculty of physic at Copenhagen (*b*).
1647. *Job. Drawitzs*, physician at Leipzig, a celebrated chemist.
1657. *Job. Rudolph. Glauberus*, a celebrated chemist of Amsterdam.

Peucerus de morbis contagiosis, &c. There were likewise two theses, or disputations, published upon it; one by *Twestrengk*, at Basil, in the year 1581, and another by *Hambergerus*, at Tubingen, in the year 1586. One *Gul. Lemnius*, a Zealander, is said to have wrote upon the scurvy. He seems to have been a very trifling author, believing it to be the same disease in man that the measles distemper is in hogs. It would appear from *Solomon Albertus*, that his performance was out of print in the year 1593.

(*b*) It was one of the most celebrated faculties of medicine at that time in Europe; of which *Olaus Wormius*, two of the *Bartholines*, and *Simon Paulli*, were then members. The latter, who was physician to the King of Denmark, has usually been ranked among the writers on the scurvy, upon account of an appendix which he added, ann. 1660, to his *Digressio de vera causa februm*, &c.

1662. *Balth. Timæus*, chief physician to the Elector of Brandenburg.
1663. *Valent. Andreas Moellenbrochius*, a physician of Erfurt.
1667. *Thomas Willis*, an English physician, Seidleian Professor at Oxford.
1668. *Everard Maynwaringe*, a physician at London.
1669. *Paul. Barbette*, a Dutch physician.
1669. *Frederic. Deckers*, Professor at Leyden.
1672. *Gualterus Charleton*, physician in ordinary to his Majesty King Charles II.
1672. *Herman. Nicolai*, a Dane.
1674. *Franciscus Deleboe Sylvius*, Professor at Leyden.
1675. *Gideon Harvey*, physician in ordinary to his Majesty King Charles II.
1676. *Bernard. Below*, physician to the King of Sweden.
1681. *Abraham. Muntingius*, Professor of Botany in Groningen.
1683. *L. Chameau*, a French physician.
1684. *Stephanus Blancardus*, a Dutch physician.
1684. *Jo. Dolæus*, chief physician, &c. to the Landgrave of Hesse-Cassel.
1685. *Michael Ettmullerus*, public Professor in the university of Leipzig.
- Thomas Sydenham*, the English Hippocrates.
1694. *Martin. Lister*, an English physician.
1696. *William Cockburn*, physician to the Royal navy of G. Britain.
1699. *Franc. Poupart*, physician at Paris.
- Arch. Pitcairn*, an eminent Scots physician.
1708. *Herman. Boerhaave*, the celebrated Leyden Professor.
1712. *Jo. Hen. de Heucher*, Professor at Wittenburg.
1720. College of physicians at Vienna.
1734. *Jo. Freder. Bachstrom*, a Dutch physician.
1734. *Damianus Sinopeus*, chief physician to the marine hospital at Cronstadt.

1737. *J. G. H. Kramer*, physician to the Imperial army in Hungary.
1739. *Frederic. Hoffmannus*, a celebrated author, First Professor of Medicine at Hall in Saxony, &c.
1747. *Abraham Nitzsch*, physician to the Russian army.
1749. The learned Dr *Richard Mead*, physician to his present Britannic Majesty, &c.
1750. Dr *Richard Russel*, physician at Lewes in Sussex.
1750. Dr *John Huxham*, a celebrated physician at Plymouth.
1752. Dr *John Pringle*, Physician-General to the British army.
1752. Dr *Charles Alston*, learned Professor of Botany and Medicine at Edinburgh.
1753. Dr *Anthony Addington*, physician at Reading.

An Alphabetical Index of Authors, &c.

Those who do not treat of the scurvy, are marked in Italic characters.

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